Matthew M. Mehalik, Ph.D.

Ex. 6 Personal Privacy (PP)

PROFESSIONAL EXPERIENCE

Breathe Project/Collaborative, Pittsburgh, PA
Executive Director — Sept. 2016 – Present

- Building and managing a network of 50+ organizations to improve Southwestern Pennsylvania's poor air quality using the best available science, technology, and public health information.
- Expanding breatheproject.org to become a nationally recognized clearinghouse and platform for science-based community engagement on regional air quality improvement.
- Focusing regional advocacy on leadership accountability for regional air quality improvements.
- Cultivating local voices so that communities can address their air quality public health challenges.
- Supporting regional public health air quality initiatives.
- Engaging regional public health professionals to elevate air quality community challenges.

Sustainable Pittsburgh, Pittsburgh, PA
Program Director — Aug. 2007–Aug. 2018

- Created Champions for Sustainability, a portfolio of sustainability performance programs for businesses and communities. Details: http://c4spgh.org
- Created the Sustainable Pittsburgh Challenge, a friendly competition to reduce GHG's, save energy, water, waste, and commuter footprint and to track/verify completed actions. From 2011 – 2015, over 200 participating employers completed over 5300 actions and saved over 25,655 metric tons of carbon dioxide, 112 million kWh of energy, enough to power over 9700 homes for a year and valued at over $9.1 million; over 67 million gallons of water; among other measured outcomes. Results: http://www.spchallenge.org
- Organized over 200+ professional learning workshops on sustainability topics ranging from operations, investment, finance, accounting, healthcare, energy efficiency, climate change, water-energy nexus, sustainable materials management, employee engagement, green chemistry, air quality, human resources, green infrastructure, among others.
- Performance programs recognition: PA Governor's Award for Environmental Excellence (2015); National Academy of Sciences Roundtable on Science and Technology for Sustainability (2015); Service to the People Award, American Society of Civil Engineering (ASCE) (2011).

Department of Industrial Engineering, Univ. of Pittsburgh, Pittsburgh, PA
Visiting Assistant Professor — Sept. 2005 – Aug. 07

- Designed sustainable products for Brazilian housing and consumer markets. Created collaborative design environments for networks of innovation. Researched learning models in service science and sustainability.

General Electric/Lockheed-Martin Corporation, Springfield, VA — Oct. 92 - Sept. 94
Satellite Controller and Satellite Flight Software Test Engineer

- Performed real-time command/control operations using large-scale hardware/software systems.

EDUCATION

Learning Research and Development Center, Univ. of Pittsburgh, Pittsburgh, PA
Postdoctoral Research Associate — June 2003- Aug. 2005

- Evaluated design-based, systems-oriented approaches to learning science as complements to inquiry-based approaches using video, ethnographic, survey, learning environment, and portfolio protocols. Developed, implemented, and assessed hands-on, design-based, systems-oriented learning modules for grades 8 – 16 with supporting teacher professional development training.

Coro Center for Civic Leadership, Pittsburgh, PA Sept. 2002 – May 03
Fellowship in Public Affairs

Science, Technology, and Society, SEAS, UVA, Charlottesville, VA
Postdoctoral Research and Teaching Associate June 2001- Aug. 2002

- Cognitive system analysis of large-scale, dynamic innovation networks. Strategic decision-making encompassing ethics in new technology design. Complex problem modeling for earth-systems engineering and management.

University of Virginia Ph.D., Systems Engineering, with Concentrations in Business Management, Ethics, and Social Studies of Innovation and Technology Aug. 97 – May 2001

- Louis T. Rader Award, Outstanding Ph.D. Student, Systems Engineering (2001); Omega Rho, Systems Engineering International Honors Society (2000)

University of Virginia M.S., Systems Engineering Aug. 95 - May 97

University of Minnesota Grad. Program, History of Technology (12 Cred.) Sept. 94 - Dec. 94

University of Virginia B.S., Aerospace Engineering, With Distinction Aug. 88 - May 92
Minor: History of Science and Technology

PROFESSIONAL MEMBERSHIPS

- American Society for Engineering Education, 2001 – present
- Association for Environmental Studies and Sciences, 2012 – present
- Reviewer, National Science Foundation (various programs), 2007, 2009, 2010, 2020, 2021

PUBLICATIONS

1 Book (co-authored); 14 Articles in Refereed Archival Journals (6 first author); 28 Articles in Refereed Proceedings (16 first author); 9 Book Chapters (6 first author); and 15 Popular/Trade/Case Studies

TEACHING POSITIONS

Heinz College, School of Public Policy and Management + Social and Decision Sciences and Humanities, Dietrich College, Carnegie Mellon, Pittsburgh, PA
Adjunct Professor of Environmental Policy Jan. 2008 – Present

Department of Industrial Engineering, University of Pittsburgh, Pittsburgh, PA
Visiting Assistant Professor Sept. 2005 - Aug. 07

Department of Systems Engineering, UVA, Charlottesville, VA
Adjunct Instructor Jan. 99 – Aug. 2002

COMMUNITY

Trustee, Phipps Conservatory, Pittsburgh, PA Nov. 2019 – Present
https://www.phipps.conservatory.org/about/leadership

School Director, Pine-Richland School District, Pittsburgh, PA Jan. 2018 – Present
https://www.pinerichland.org/Page/5733

Board Treasurer, CCI, Inc., Pittsburgh, PA Dec. 2014 – July 2020
https://getenergysmarter.org

BIOGRAPHICAL SKETCH

NAME: Wenzel, Sally E.

eRA COMMONS USER NAME (credential, e.g., agency login): Wenzel

POSITION TITLE: Professor of Medicine, Director, University of Pittsburgh Asthma Institute

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	COMPLETION DATE	FIELD OF STUDY
University of Florida, Gainesville, FL	BS	05/1978	Medical & Biological Science
University of Florida, Gainesville, FL	MD	05/1981	Medicine
Wake Forest University Baptist Medical Center, Winston-Salem, NC	Internship	05/1982	Internal Medicine
Wake Forest University Baptist Medical Center, Winston-Salem, NC	Residency	05/1984	Internal Medicine
Medical College of Virginia, Richmond, VA	Fellowship	05/1986	Pulmonary Medicine

A. Personal Statement

Dr. Wenzel has been a translational researcher, educator and clinician in human airway diseases for decades. In particular, Dr. Wenzel studies severe asthma and its phenotypes from the clinical-environmental to the molecular and genetic level. She has recruited hundreds of severe asthma patients for human-based research studies. She is one of the key scientists initiating the concept of asthma phenotypes. She has led groundbreaking clinical trials of Type-2 targeted therapies published in the New England Journal of Medicine and the Lancet. Dr. Wenzel is one of seven NHLBI funded investigators in the Severe Asthma Research Program (SARP) network, a network she has been a central part of for over 20 years. She is also Co-PI on a P01 grant on severe asthma. Her lab is one of few to match an extensive clinical phenotype of a patient with responses at a cellular/molecular and imaging level. More recently she was selected to chair the Department of Environmental and Occupational Health at the University of Pittsburgh, where she is now leading efforts to address the interactions of various pollutants, oxidative stress and epithelial cells with airway diseases like asthma. She has authored more than 350 publications and is the recipient of numerous awards for her career work in all aspects of asthma.

Positions, Scientific Appointments, and Honors

Positions and Scientific Appointments:

2019-present	Rachel Carson Chair in Environmental Health. Graduate School of Public Health
2018-Present	Chair, Dept of Environmental and Occupational Health, Graduate School of Public Health
2014-Present	Professor of Immunology University of Pittsburgh School of Medicine (secondary appt)
2013-2018	Subsection Chief of Allergy, Division of Pulmonary, Allergy and Critical Care Medicine, University of Pittsburgh
2012-2018	UPMC Chair in Translational Airway Biology, University of Pittsburgh
2011-Present	Professor, Clinical & Translational Science Institute, University of Pittsburgh (secondary appt)
2006-Present	Professor of Medicine, Division of Pulmonary, Allergy and Critical Care Medicine, Director, The University of Pittsburgh Asthma Institute at UPMC and the University of Pittsburgh School of Medicine
2005-2006	Chair in Pulmonary Biology, Drs. Harold and Mary Zirin, University of Colorado Health Sciences Center
2001-2006	Professor of Medicine, University of Colorado Health Sciences Center, Denver, CO
2001-2006	Professor of Medicine, National Jewish Medical and Research Center, Denver, CO
1995-2001	Associate Professor, National Jewish Medical and Research Center, and University of Colorado Health Sciences Center, Denver, CO
1988-1995	Assistant Professor, National Jewish Center for Immunology and Respiratory Medicine, and University of Colorado Health Sciences Center, Denver, CO

1987-1988 Instructor/Fellow, National Jewish Center for Immunology and Respiratory Medicine, and University of Colorado Health Sciences Center, Denver, CO
1986-1987 Clinical Instructor and Research Fellow, Medical College of Virginia, Richmond, VA

Honors:

2021 ATS J. Burns Amberson Lecturer
2020 ATS - All Scientific Accomplishment Award
2018 Ladies Hospital Aid Society Trailblazer Award
2017 ERS Presidential Award
2016 ATS - Breathing for Life Award
2014 American Association of Physicians
2010 American Thoracic Society Scientific Achievement Award
2005 Colorado ALA President's Award
2005 ATS – Elizabeth A. Rich MD Award
2001 "Who's Who in ATS", American Thoracic Society
2000 "President's Award", National Jewish Medical and Research Center
1994 Co-Chairman, Aspen Lung Conference
1981 Travel/Study Scholarship to University at Hannover, Germany
1981 Junior Honor Medical Program
1978 Phi Beta Kappa

B. Contribution to Science

1. **Severe Asthma**. Dr. Wenzel's efforts Her efforts led to the recognition that severe asthma is a "real" problem that impacts 5-10% of the asthma population. Her pathologic studies of severe asthma identified a role for neutrophils and mast cells in severe asthma, and identified a variant of asthma associated with peripheral lung granuloma formation (asthmatic granulomatosis). She was instrumental in advancing gene expression and molecular phenotyping studies of airway epithelial cell abnormalities in severe asthma. She is considered one of the world leaders in understanding and treating this group of patients.
   a. Chung KF, **Wenzel SE***, Brozek JL, Bush A, et al. International ERS/ATS guidelines on definition, evaluation and treatment of severe asthma. Eur Respir J. 2014 *Co-first author Feb;43(2):343-73. doi: 10.1183/09031936.00202013. Epub 2013 Dec 12. Erratum in: Eur Respir J. 2014 Apr;43(4):1216. Dosage error in article text. PubMed PMID: 24337046.
   b. **Wenzel SE**. Severe Adult Asthmas: Integrating Clinical Features, Biology and Therapeutics to Improve Outcomes. Am J Respir Crit Care Med. 2020 Dec 16. doi: 10.1164/rccm.202009-3631CI. Epub ahead of print. PMID: 33326352
   c. **Wenzel SE**, Ford L, Pearlman D, Spector S, et al. Dupilumab in Persistent Asthma with Elevated Eosinophil Levels. N Engl J Med 2013 368(26): 2455-2466. PMID:23688323
   d. **Wenzel SE**, Vitari CA, Shende M, Strollo DC, Larkin A, Yousem SA. Asthmatic granulomatosis: a novel disease with asthmatic and granulomatous features. Am J Respir Crit Care Med. 2012 Sep 15;186(6):501-7. doi: 10.1164/rccm.201203-0476OC. Epub 2012 Jul 5. PMID: 22773731.
2. **Asthma Phenotyping**. Dr. Wenzel has been a leader in the movement that asthma is not a single disease. Rather, "asthma" is an umbrella term, encompassing multiple "phenotypes", and more recently, endotypes. She was the first to identify the presence of eosinophilic inflammation in the lungs of a subset of patients with severe asthma. Numerous therapies specifically targeted to eosinophilic asthma are now approved as targeted asthma therapies.
   a. **Wenzel SE**, Schwartz LB, Langmack EL, Halliday JL, et al. Evidence that severe asthma can be divided pathologically into two inflammatory subtypes with distinct physiologic and clinical characteristics. Am J Respir Crit Care Med. 1999 Sep;160(3):1001-8. PubMed PMID: 10471631.
   b. Wu W, Bleecker E, Moore W, Busse WW, et al including **Wenzel SE**. Unsupervised phenotyping of Severe Asthma Research Program participants using expanded lung data. J Allergy Clin Immunol. 2014 May;133(5):1280-8. doi: 10.1016/j.jaci.2013.11.042. Epub 2014 Feb 28. PMID: 24589344; PMCID: PMC4038417.
   c. Ray A, Camiolo M, Fitzpatrick A, Gauthier M, **Wenzel SE**. Are We Meeting the Promise of Endotypes and Precision Medicine in Asthma? Physiol Rev. 2020 Jul 1;100(3):983-1017. doi: 10.1152/physrev.00023.2019. Epub 2020 Jan 9. PMID: 31917651; PMCID: PMC7474260.

BIOGRAPHICAL SKETCH

NAME: **Gentile, Deborah A.**

eRA COMMONS USER NAME (credential, e.g., agency login):

POSITION TITLE: Medical Director, Community Partners in Asthma Care

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	COMPLETION DATE	FIELD OF STUDY
St. Francis College, Loretto, PA	BS	05/1987	Biology
University of Pittsburgh, Pittsburgh, PA	MD	05/1994	Medicine
University of Pittsburgh Medical Center, Pittsburgh, PA	Residency	06/1997	Pediatrics
University of Pittsburgh Medical Center, Pittsburgh, PA	Fellowship	06/1999	Allergy/Immunology

A. Personal Statement

Dr. Gentile has a strong interest in pediatric atopy/asthma and much of her career has focused on elucidating environmental and genetic factors that influence the development/expression of atopy/asthma. Her earlier work focused on examining the effect of environmental factors such as respiratory viruses and exposure to environmental tobacco smoke on cytokine immune responses and examined the impact of specific cytokine polymorphisms on cytokine responses to environmental triggers. For the past decade, she has received foundation funding to evaluate asthma outcomes and environmental triggers, including air pollution, among residents from environmental justice communities in Southwestern PA. She has authored more than 70 publications and is the recipient of numerous awards.

B. Positions and Honors

Positions:

2021-present	Adjunct Assistant Professor Department of Occupational and Environmental Health University of Pittsburgh School of Public Health
2019-present	Director of Allergy, Asthma and Immunology East Suburban Pediatrics, Murrysville PA
2019-present	Medical Director Community Partners in Asthma Care Pittsburgh PA
2017-2019	Director of Research, Division of Allergy, Asthma and Immunology Pediatric Alliance, Pittsburgh PA
2002-2016	Director of Research, Division of Allergy, Asthma and Immunology Allegheny Health Network, Pittsburgh PA
2014-2016	Professor of Medicine, Temple University School of Medicine, Philadelphia PA
2011-2014	Associate Professor of Medicine, Temple University School of Medicine Philadelphia, PA
2002-2012	Associate Professor of Pediatrics, Drexel University School of Medicine, Philadelphia PA
1999-2011	Assistant Professor of Pediatrics, University of Pittsburgh School of Medicine
1999-2029	Board Certification, American Board of Allergy and Immunology
1995-present	Pennsylvania Medical License

Honors:

1992	Recognition Award for New Investigators; Clinical Immunology Society
1997	Clinical Fellowship Award; America Academy of Allergy, Asthma and Immunology
1998	Clemens Von Pirquet Award, American College of Allergy, Asthma and Immunology
1999	Faculty Development Award; American College of Allergy, Asthma, and Immunology
2000	Dalsemer Young Faculty Award; American Lung Association
2003	Outstanding Abstract Award; Allergy/Immunology; American Academy of Pediatrics
2003	Healthcare Hero Finalist Innovation/Research; Pittsburgh Business Times
2013	Physicians Excellence Award Nominee; American Lung Association of PA

2014 Healthcare Hero Individual Physician; Pittsburgh Business Times
2017 Community of We Recognition, Heinz Endowments
2019 Michele Madoff Award of Environmental Excellence, Group Against Smog and Pollution
2019 Dewey Award, Clean Water Action

C. Contributions to Science

1. **Association between Outdoor Air Pollution and Asthma Outcomes in Environmental Justice Neighborhoods of Western PA.** Asthma is a major public health issue in Southwestern PA. Over the last decade, Dr. Gentile has been the PI of a large project tracking asthma outcomes in disparate populations in Southwestern PA. The results of her work demonstrate high rates of asthma prevalence and poor control in large cohort of 1,200 school children residing near point sources of pollution. Additionally, she documented a near doubling of asthma attacks in nearby residents following an industrial accident that led to increased emissions of air pollution. This work demonstrates the magnitude of the asthma issue in Southwestern PA and identifies air pollution reduction as a method for primary prevention of asthma. She continues to serve as PI for this work.
    a. **Gentile D,** Morphew T, Elliott J, et al. Asthma prevalence and control among schoolchildren residing near outdoor air pollution sites. J Asthma 2020;5;1-11. doi:10.1080/02770903.2020.1840584.
    b. Byrwa-Hill B, Venkat A, Presto A, et al (including **Gentile D**). Lagged association of ambient outdoor air pollutants with asthma-related emergency department visits within the Pittsburgh region. Int J Environ Res Public Health 2020:17:8619. doi:10.3390/ijerph17228619.
    c. DePerrior, Rager J, **Gentile D**, Talbott E. The relationship between pollen, air pollution and asthma exacerbations in children in Allegheny County, Pennsylvania: a case-crossover analysis. Arch Epidemiol 2021;5:148. doi:10.29011/2577-2252.100048.
    d. Morphew T, Venkat A, Graham J, et al (including **Gentile D**). Impact of a large fire and subsequent pollution control failure at a coke works on acute asthma exacerbations in nearby adults. Toxics 2021;9:147. doi:10.3390/toxics9070147.
2. **Treatment Gaps in Asthma Care**. Dr. Gentile participated in the recent NHLBI Asthma Net trials whose goal was to fill treatment gaps in asthma care. She participated in studies that examined the effects of vitamin D supplementation on asthma control, early administration of azithromycin on prevention of severe lower respiratory tract illnesses in children, acetaminophen versus ibuprofen in young children with mild persistent asthma, individualized therapy for persistent asthma in young children, and quintupling inhaled corticosteroids to prevent childhood asthma exacerbations. The results of this work provide a framework for improved asthma treatment in both pediatric and adult patients. Dr. Gentile was a satellite site PI on all of these studies.
    a. Sheehan WJ, Mauger DT, Paul IM, Moy JN, et al. Acetaminophen versus ibuprofen in young children with mild persistent asthma. N Engl J Med 2016;375(7):619-30.
    b. Jackson DJ, Bacharier LB, Mauger DT, Boehmer S, et al. Quintupling inhaled glucocorticoids to prevent childhood asthma exacerbations. N Engl J Med 2018;378(10):891-901.
    c. Lazarus SC, Krishnan JA, King TS, Lang JE, et al. Mometasone or tiotropium inn mild asthma with a low sputum eosinophil level. N Engl J Med 2019;380(21):2009-19.
    d. Weschler ME, Szefler SJ, Ortega VE, Pongracic JA, et al. Step-up therapy in black children and adults with poorly controlled asthma. N Engl J Med 2019;381(13):1227-39.

D. Research Support

Ongoing Research Support

Heinz Endowment (Gentile) **01/01/2014-06/30/2024**

Surveillance and Tracking of Asthma in Southwestern PA

This study is assessing asthma prevalence, risk factors and the impact of environmental exposures, including air pollution, in environmental justice communities in Southwestern PA. **Role:** PI

Pennsylvania Medical Society Innovation Grant (Gentile) **12/01/2021-12/31/2022**

Comprehensive Community Based Program to Improve Asthma Outcomes in an EJ Community

This project is evaluating the effectiveness and sustainability of providing a specialty asthma clinic and ad wrap-around services in partnership with a federally qualified health clinic. **Role:** PI

Allegheny County Medical Society Foundation **12/01/2021-12/31/2022**

Expansion of a Specialty Asthma Clinic to EJ Communities

This project is funding the start-up costs of additional asthma clinics in EJ communities.

Role: PI
01/01/2022-12/31/2022

Ex. 6 Personal Privacy (PP)

DOUGLAS KRINGS

EXPERIENCE

KRINGS & ASSOCIATES LLC, Pittsburgh, Pennsylvania
PRINCIPAL, 2015- PRESENT

Provides clients in chemical and energy industries with tailored and optimized support in air permitting and reporting, NPDES permitting, auditing and site remediation and closure activities.

ENERCON, Pittsburgh, Pennsylvania
SENIOR TECHNICAL SPECIALIST, 2011 - PRESENT

Mr. Krings provides a variety of environmental, health and safety consulting services within several service areas, including compliance auditing, regulatory interpretation, air quality, EHS management, due diligence, wastewater engineering and NPDES permitting.

ENSR/AECOM, Pittsburgh, Pennsylvania
SENIOR TECHNICAL SPECIALIST, 2008-2011

Mr. Krings, served as a Senior Technical Specialist providing a variety of environmental, health and safety consulting services within several service areas, including compliance auditing, regulatory interpretation, air quality, EHS management, due diligence, wastewater engineering and NPDES permitting. In his 46 years of experience, he has dealt with all facets of major permitting efforts (Title V, NPDES, RCRA Part B).

BAYER MATERIAL SCIENCE, Pittsburgh, Pennsylvania
Manager, Audit Programs, 2007-2008

Interfaced with manufacturing site leadership to schedule and conduct audits, as well as present findings. Selected and trained auditors. Developed auditing tools and protocols. Presented reports and findings to company management. Reduced audit burden on sites and number of hours needed for conduction.

Manager, Air Programs, 1994-2007

Served as Co-Chair of American Chemistry Council (ACC) air team. Earned recognition as leader of ACC residual risk workgroup. Represented ACC in successful advocacy, leading to No Further Action rule. Worked closely with executive vice president on environmental regulatory and legislative issues. Provided both regulatory and technical guidance and support to production sites. Authored corporate procedures and guidelines on topics ranging from air permitting to waste minimization. Provided air dispersion modeling support to sites and business units for both construction permitting and air toxics impact assessments.

Manager, Air and Water Programs, 1990-1994

Developed and implemented programs in response to 1990 Clean Air Act amendments. Improved corporate environmental procedures and guidelines. Enhanced process technology and developed capital processes through enhanced productivity and quality.

ADDITIONAL EXPERIENCE

Manager Water Programs, 1987-1990. Directed National Pollutant Discharge Elimination permit negotiations. Developed initial environmental audit program. Interacted with regulatory agencies on routine compliance issues. ***Environmental Supervisor,*** 1984-1987. Developed 300-page National Pollutant Discharge Elimination comment package, winning 90% of disputed points. ***Senior Environmental Engineer,*** 1979-1984. Held responsibility for technical support development, and submission of air construction permits for engineering projects.

NEVILLE CHEMICAL COMPANY, Pittsburgh, Pennsylvania, ***Production Engineer,*** 1975-1979. Reduced operating costs 30% over three years. Managed wastewater treatment operations. Coordinated research and design team for wastewater treatment plant.

EDUCATION

UNIVERSITY OF PITTSBURGH, Pittsburgh, Pennsylvania
B.S., Chemical Engineering, 1975

PROFESSIONAL DEVELOPMENT

Certified Optical Gas Imaging Provider, 2012
Air Dispersion Modeling Workshop, 2005
Interviewing Skills Workshop, 1990
Management Training Course, 1988-1989
Advanced Supervisor Workshop, 1984

Mark Dixon
Biosketch

Mark Dixon is an award-winning filmmaker, activist, and public speaker exploring the frontiers of social change on a finite planet. Mark graduated from Stanford University in 1997 with a degree in Industrial Engineering. He started his technology career in Silicon Valley and worked for two start-up companies, including Akimbo Systems, where he managed the deployment of nearly 10,000 programs for its Internet video service.

As evidence for global warming and resource depletion moved into prominent view on an international scale, Mark decided to refocus his life on tackling those issues, launching YERT – Your Environmental Road Trip in 2006 with his college buddy, Ben Evans. Mark (as Producer) and Ben (as Director) ultimately created a feature film documenting the YERT adventure, which has been enthusiastically screened by dozens of film festivals, colleges, and community groups around the world. The YERT project has been featured in notable press outlets including the San Francisco Chronicle, the Huffington Post, the National Catholic Reporter, and Pittsburgh's own City Paper. YERT has also earned numerous awards, most notably Audience Awards at the San Luis Obispo International Film Festival and the Environmental Film Festival at Yale. YERT – Your Environmental Road Trip was picked up for distribution in the U.S. and Canada by First Run Features and continues to screen around the world. Distribution outlets include Netflix, iTunes, Amazon, and YERT.com. Mark's efforts on YERT also moved PennFuture to name him a Citizens Choice Green Power Hero in 2011.

In 2011, Mark received PennFuture's "Citizens Choice Green Power Hero" award for his work on the YERT film and was featured in the cover story for the Spring 2014 edition of Bridge to Light magazine. Mark's most recent film, "The Power of One Voice: A 50-Year Perspective on the Life of Rachel Carson," was accepted into the 2015 American Conservation Film Festival, the 2015 Woods Hole Film Festival, and the 2015 AASHE Conference (Association for the Advancement of Sustainability in Higher Education). Mark's films and public speeches have inspired audiences around the world, including TEDx Pittsburgh, Sony Pictures, U.S. Environmental Protection Agency, Phi Beta Kappa Society, Bioneers Conference, the Mother Earth News Fair, Carnegie Science Center, and the world's oldest film school: Russia's VGIK (Gerasimov Institute of Cinematography).

In December 2015, Mark crowdfunded a journey to Paris, France to attend and cover the United Nations Climate Change Conference – Conference of Parties (COP21) as credentialed press (blog and videos at https://markatcop21.wordpress.com/). He gave over 30 presentations about the topic and filmed one before and one after the trip for anybody to view.

Mark is currently working on a new film entitled, "Inversion: The Unfinished Business of Pittsburgh's Air." (https://inversiondoc.com/) This film examines air quality issues in the greater Pittsburgh region, from Clairton Coke Works to the proposed Shell Ethane Cracker in Beaver County. It will focus on a variety of unique "inversion" conditions,

including weather inversions contributing to Pittsburgh's notoriously polluted (and often stinky) air, a citizen power inversion created by advances in technology and crowd-sourced pollution data, and an industrial inversion exhibited by the replacement of old, dirty manufacturing by clean tech (albeit under threat from local natural gas development). As a part of that film project, Mark also assisted with the deployment of over 100 low-cost PurpleAir monitors throughout the region. Mark received recognition for his clean air advocacy when named GASP's (Group Against Smog and Pollution) Champion for Healthy Air in 2017 (along with Dr. Deborah Gentile).

Mark's activism photography has been featured in a wide variety of media and outlets. His photo, "#'s Are the New Protest Signs," is currently featured at the Smithsonian's National Museum of African American History and Culture after first appearing in the online version of The Atlantic (link). Additional photos have been featured on BillMoyers.com, CommonDreams.org, NewPittsburghCourierOnline.com, InsideClimateNews.org, NCRegister.com, WESA.fm, and many other websites. You can browse all of Mark's photos at https://flickr.com/photos/9602574@N02/albums (most free to use via Creative Commons license: CC BY 2.0).

A citizen of the world, Mark has lived on three continents and visited 26 countries, particularly enjoying a year in Tokyo, Japan. Mark has also entertained audiences on stage with choral and solo performances of jazz, comedy, gospel, opera, and classical music as well as improv and musical theater.

Mark Dixon
415-672-5537 (c)

NORA D. JOHNSON

Ex. 6 Personal Privacy (PP)

Ex. 6 Personal Privacy (PP)

VOLUNTEER EXPERIENCE

2012 - present

Since 2012, when my husband retired, I have volunteered in projects engaged in environmental protection. I initiated the Earth Care Team at my church, Sixth Presbyterian Church in Pittsburgh, and led it for about four years. I joined Beaver County Marcellus Awareness Community in 2017 and became Secretary in 2018. I am currently serving in that capacity.

WORK EXPERIENCE

2000 – 2012 **Assistant**, CLIFFORD R. JOHNSON, AMERICAN EXPRESS FINANCIAL ADVISOR
Worked with FASware, financial advisory software. Prepared individual financial plans, including assets, liabilities, policies, income and expense information.

July, 1996 – December, 2001 **Coordinator**, PHYSICIANS FOR SOCIAL RESPONSIBILITY, PITTSBURGH
Maintained financial and organizational records. Prepared payroll withholding reports. Coordinated meetings and events. Kept minutes at organizational meetings. Prepared annual and financial reports for governmental agencies and national organization. Made purchases.

February, 1996 - July 1996 **Sales representative and office organizer**, RECREATION EQUIPMENT UNLIMITED, INC.
Made sales calls, arranged for the reorganization of the company office.

May, 1994 – December, 1996 **Community Organizer**, STEEL VALLEY AUTHORITY
Coordinated meetings with member communities, coordinated conferences and events, wrote grant proposals.

February, 1995 – July, 1995 **Job program developer**, EAST END COOPERATIVE MINISTRY
Established and administered job program for unemployed clients of the agency.

January, 1994 – November, 1994 **Public Outreach Coordinator**, MAGLEV, INC.
Coordinated and gave presentations to community groups in the tri-state area, edited and coordinated newsletter and brochure, coordinated volunteer presenters.

1990 – 1994 **Executive Director**, HOMESTEAD UNEMPLOYED CENTER, INC. (RAINBOW KITCHEN)
Oversaw audit process, kept financial records and maintained accounting system. Managed program development, organizational management,

fundraising and public relations, personnel management. Liaison to Board of Directors and designated committees.

1988 – 1990 **Hot Meals Coordinator**, HOMESTEAD UNEMPLOYED CENTER, INC. (RAINBOW KITCHEN)
Managed Food Pantry and Hot Lunch Program operations and supervised kitchen staff and volunteers.

1987 – 1988 **Organizer**, THOMAS MERTON CENTER
Coordinated activist events, design, writing and production of monthly newsletter.

1985 – 1988 **Owner**, WEARABLE DESIGN
Designed, produced and marketed one-of-a-kind clothing.

1984 – 1985 **Administrative Assistant to the Director of Development**, JOB ADVISORY SERVICE
Wrote solicitation letters for fundraising campaigns, performed daily office duties.

1979 – 1984 **Teaching Assistant**, DEPARTMENT OF ECONOMICS, KASSEL UNIVERSITY; Kassel, West Germany
Designed and taught the sole English-language economics course.

EDUCATION

1980 – 1984 **Studied Product Design**, KASSEL UNIVERSITY; West Germany

1978 **Bachelor's Degree**, Economics, UNIV. OF PITTSBURGH

SKILLS AND ACCOMPLISHMENTS

Financial: Oversaw audit process, maintained organizational accounting system, kept income and expenditure records, prepared payroll withholding reports.

Fundraising: Grant coordination and writing. Presentation of grant applications. Evaluation of grants for funding.

Public Relations: Conducted promotional presentations. Developed audio-visual presentation to be used by project staff as well as volunteers. Developed and maintained organizations' relationships with groups in a large geographical area.

Management: Supervised diverse personnel that included volunteers as well as paid staff. Reorganized food pantry intake process, organized and managed the "8th Avenue Street Trees" project.

Administration: Prepared organizational budgets; have bookkeeping skills; interviewed and selected professional consultants; kept records and made reports.

CLIFFORD J. LAU

Working with several Environmental in the Pittsburgh and Beaver County Area

EXPERIENCE

FIVE AREA UNIVERSITIES, Pittsburgh, Pennsylvania
Adjunct Professor, 08/2008 - Present
Teaching Chemistry and Environmental Science

BAYER MATERIAL SCIENCE, Pittsburgh, Pennsylvania
Chemical Consultant, 08/2008-01/2010

Worked in the Regulatory Compliance group of the Bayer Materials Science HSEQ Health, Safety, Environment and Quality Department

BAYER MATERIAL SCIENCE, Pittsburgh, Pennsylvania
Senior Research Scientist, 2003-2008

Led manufacturing, formulations development and had technical responsibility for medical, food-grade, and water bottle polycarbonate material product lines.

BAYER MATERIAL SCIENCE – BAYER CORPORATION -- MILES, INC 2010 to 1987

BAYER CORPORATION, Pittsburgh, Pennsylvania
Senior Research Scientist, 2000-2002

Oversaw research services group with five personnel, including spray technology. Held responsibility for shipping, receiving and inventory of chemicals for the laboratory to meet safety regulations.

Research Scientist, Sarnia, Ontario, Canada, 1996-1999

Managed adhesive laboratory with five personnel, providing customer support. Worked on applications for adhesive raw materials.

Associate Research Scientist, Pittsburgh, Pennsylvania, 1992-1996

Conducted research in corporate polymer research group, in areas of polymer blends, polyurethanes and organic chemistry.

MILES, INC., Pittsburgh, Pennsylvania
Senior Development Chemist, 1987-1992

Conducted development work in reaction injection molding group, using polyurethane and polyurea materials for application in exterior automotive body panels and fascia. .

POLAROID CORPORATION, Cambridge, Massachusetts,
Associate Scientist, 1977-1982.

Conducted research and synthesized photographic compounds, including opacification dyes and developers. Created silver solvents and dye developers.
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EDUCATION

OHIO STATE UNIVERSITY, Columbus, Ohio
Ph.D., Organic Chemistry, 1987

NORTHEASTERN UNIVERSITY, Boston, Massachusetts
M.S., Organic Chemistry, 1982

OHIO STATE UNIVERSITY, Columbus, Ohio
B.S., Chemistry, 1977

6 PATENTS

U.S. Patent #5,623,019: Compatibilized thermoplastic molding composition. Wiggins, J., Pielartzik, H., Kumpf, R., Franke, J., Lau, C.J., (Bayer Corp., USA), April 22, 1997.

U.S. Patent #5,605,961: Thermoplastic composition containing polyurethane and polypropylene. Lee, B., Pielartzik, H., Kumpf, R., Lau, C.J., Yourd, R., Wiggins, J. (Bayer Corp., USA), February 25, 1997.

U.S. Patent #5,538,786: Process for the preparation of filled urethane-based reinforced moldings and the resultant products. Hurley, M.F.; Lau, C.J.; Lee, B., (Bayer Corp., USA), July 23, 1996.

U.S. Patent #5,468,432: Preparation of filled urethane-based reinforced moldings with good physical properties. Hurley, M.F.; Lau, C.J.; Lee, B., (Miles Inc., USA), November 21, 1995.

U.S. Patent #5,158,607: Internal release agents and their use with active hydrogen-containing compounds in reaction-injection molding. Mafoti, R.; Lau, C.J., (Mobay Corp., USA), October 22, 1992.

U.S. Patent #5,135,962: Internal mold release agent for use in polyurea reaction-injection molding systems. Lau, C.J.; Sanns, F. (Mobay Corp., USA), August 4, 1992.

7 PUBLICATIONS and 5 PRESENTATIONS

Analyze the Effectiveness of New Allophanate-modified MDIs for Preparing Polyurethane Adhesive Applications, Dormish, J., Lau, C.J., Kinney, C., Slack, W., Adhesive Age (2000), 43 (4), 33-34, 36, 40.

Ramen Chemical Imaging: Non-invasive Visualization of Polymer Blend Architecture, Schaeberle, M.D.; Karakatsanis, C.G.;Lau, C.J.; Treado, P.J., Department of Chemistry, University of Pittsburgh, Anal. Chem. (1995), 67 (23), 4316-21.

Uni- and Biparticulate Electrophilic Additions to Conjugated Bis (bicyclo[1.1.0]butanes), L.A. Paquette, C.J. Lau, R.D. Rogers, J. Am. Chem. Soc. 110, 2592, (1988).

An Example of Spontaneous Resolution by Sublimation, L.A. Paquette and C.J. Lau, J. Org. Chem., 52, 1634 (1987).

Electrophilic Capture by Conjugated Bis (bicyclo[1.1.0]butanes). Site Specificity of the Initiation Step and Thermodynamic Control of the Ensuing Electronic Reorganization, L.A. Paquette, C.J. Lau, A.R. Browne and M.E. O'Brien, J. Am. Chem. Soc. 108, 8111 (1986).

Jacob D. Wiedemer

Ex. 6 Personal Privacy (PP)

Ex. 6 Personal Privacy (PP)

Education

Cornell University, **Bachelor of Science** Graduated May 2019
Major: **Interdisciplinary Studies**; Minor: **Inequality Studies**

Relevant Coursework

Leadership for Sustainability; Oral Communication; Climate and Global Warming; Controversies about Inequality; Ecology and the Environment; Social Inequality; Comparative Social Inequalities; Indigenous Issues in Global Perspectives

Experience

Eurofins Test America, Pittsburgh, PA October 2019 – September 2020
Field and Lab Technician

- Conducted sampling at multiple industrial manufacturing facilities throughout western PA, Ohio and West Virginia in accordance with National Pollutant Discharge Elimination System (NPDES)
- Organized the delivery of field samples; prepared samples for analysis

Beaver County Marcellus Awareness Community (BCMAC) September 2020 - Present
Community Organizer

- Initiated accountability-related information gathering, synthesis and communication in useful reports
- Conducted community canvassing and phone banking
- Facilitated citizen-science environmental monitoring for noise and air

Skills

- Excellent Written and Oral Communication
- Proficient in MS Office and Google G-Suite Programs
- Maintaining and building membership databases

Activities and Interests

- Cornell Organization for Labor Action (COLA) Organizer, 2018-2019
- Cornell Ecology House Reading & Action Environmental Justice Group
- Research Assistant, Cornell University Department of Animal Science, 2017-2019
    - Compiled statistical results of research and product characteristics
    - Presented Research for grant funding through the Atkinson Center for Sustainability

OMB Number: 2030-0020
Expiration Date: 06/30/2024

Preaward Compliance Review Report for All Applicants and Recipients Requesting EPA Financial Assistance

Note: Read Instructions before completing form.

I. A. Applicant/Recipient (Name, Address, City, State, Zip Code)

Name: Mike Kane

Address: 216 Franklin Street, Suite 400

City: Johnstown, PA

State: PA: Pennsylvania Zip Code: 15901-1911

B. DUNS No. 799926329

II. Is the applicant currently receiving EPA Assistance? ☐ Yes ☒ No

III. List all civil rights lawsuits and administrative complaints pending against the applicant/recipient that allege discrimination based on race, color, national origin, sex, age, or disability. (Do not include employment complaints not covered by 40 C.F.R. Parts 5 and 7.)

None

IV. List all civil rights lawsuits and administrative complaints decided against the applicant/recipient within the last year that allege discrimination based on race, color, national origin, sex, age, or disability and enclose a copy of all decisions. Please describe all corrective actions taken. (Do not include employment complaints not covered by 40 C.F.R. Parts 5 and 7.)

None

V. List all civil rights compliance reviews of the applicant/recipient conducted by any agency within the last two years and enclose a copy of the review and any decisions, orders, or agreements based on the review. Please describe any corrective action taken. (40 C.F.R. § 7.80(c)(3))

None

VI. Is the applicant requesting EPA assistance for new construction? If no, proceed to VII; if yes, answer (a) and/or (b) below.

☐ Yes ☒ No

a. If the grant is for new construction, will all new facilities or alterations to existing facilities be designed and constructed to be readily accessible to and usable by persons with disabilities? If yes, proceed to VII; if no, proceed to VI(b).

☐ Yes ☐ No

b. If the grant is for new construction and the new facilities or alterations to existing facilities will not be readily accessible to and usable by persons with disabilities, explain how a regulatory exception (40 C.F.R. 7.70) applies.

VII. Does the applicant/recipient provide initial and continuing notice that it does not discriminate on the basis of race, color, national origin, sex, age, or disability in its program or activities? (40 C.F.R 5.140 and 7.95)	☒ Yes	☐ No
a. Do the methods of notice accommodate those with impaired vision or hearing?	☒ Yes	☐ No
b. Is the notice posted in a prominent place in the applicant's offices or facilities or, for education programs and activities, in appropriate periodicals and other written communications?	☒ Yes	☐ No
c. Does the notice identify a designated civil rights coordinator?	☒ Yes	☐ No
VIII. Does the applicant/recipient maintain demographic data on the race, color, national origin, sex, age, or handicap of the population it serves? (40 C.F.R. 7.85(a))	☒ Yes	☐ No
IX. Does the applicant/recipient have a policy/procedure for providing access to services for persons with limited English proficiency? (40 C.F.R. Part 7, E.O. 13166)	☒ Yes	☐ No

X. If the applicant is an education program or activity, or has 15 or more employees, has it designated an employee to coordinate its compliance with 40 C.F.R. Parts 5 and 7? Provide the name, title, position, mailing address, e-mail address, fax number, and telephone number of the designated coordinator.

XI. If the applicant is an education program or activity, or has 15 or more employees, has it adopted grievance procedures that assure the prompt and fair resolution of complaints that allege a violation of 40 C.F.R. Parts 5 and 7? Provide a legal citation or Internet Address for, or a copy of, the procedures.

For the Applicant/Recipient

I certify that the statements I have made on this form and all attachments thereto are true, accurate and complete. I acknowledge that any knowingly false or misleading statement may be punishable by fine or imprisonment or both under applicable law. I assure that I will fully comply with all applicable civil rights statutes and EPA regulations.

A. Signature of Authorized Official	B. Title of Authorized Official	C. Date
Mike Kane	President	03/25/2022

For the U.S. Environmental Protection Agency

I have reviewed the information provided by the applicant/recipient and hereby certify that the applicant/recipient has submitted all preaward compliance information required by 40 C.F.R. Parts 5 and 7; that based on the information submitted, this application satisfies the preaward provisions of 40 C.F.R. Parts 5 and 7; and that the applicant has given assurance that it will fully comply with all applicable civil rights statures and EPA regulations.

A. *Signature of Authorized EPA Official	B. Title of Authorized Official	C. Date

*** See Instructions**

Instructions for EPA FORM 4700-4 (Rev. 06/2014)

General. Recipients of Federal financial assistance from the U.S. Environmental Protection Agency must comply with the following statutes and regulations.
Title VI of the Civil Rights Acts of 1964 provides that no person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance. The Act goes on to explain that the statute shall not be construed to authorize action with respect to any employment practice of any employer, employment agency, or labor organization (except where the primary objective of the Federal financial assistance is to provide employment). Section 13 of the 1972 Amendments to the Federal Water Pollution Control Act provides that no person in the United States shall on the ground of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under the Federal Water Pollution Control Act, as amended. Employment discrimination on the basis of sex is prohibited in all such programs or activities. Section 504 of the Rehabilitation Act of 1973 provides that no otherwise qualified individual with a disability in the United States shall solely by reason of disability be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance. Employment discrimination on the basis of disability is prohibited in all such programs or activities. The Age Discrimination Act of 1975 provides that no person on the basis of age shall be excluded from participation under any program or activity receiving Federal financial assistance. Employment discrimination is not covered. Age discrimination in employment is prohibited by the Age Discrimination in Employment Act administered by the Equal Employment Opportunity Commission. Title IX of the Education Amendments of 1972 provides that no person in the United States on the basis of sex shall be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance. Employment discrimination on the basis of sex is prohibited in all such education programs or activities. Note: an education program or activity is not limited to only those conducted by a formal institution. 40 C.F.R. Part 5 implements Title IX of the Education Amendments of 1972. 40 C.F.R. Part 7 implements Title VI of the Civil Rights Act of 1964, Section 13 of the 1972 Amendments to the Federal Water Pollution Control Act, and Section 504 of The Rehabilitation Act of 1973. The Executive Order 13166 (E.O. 13166) entitled; "Improving Access to Services for Persons with Limited English Proficiency" requires Federal agencies work to ensure that recipients of Federal financial assistance provide meaningful access to their LEP applicants and beneficiaries.

Items "Applicant" means any entity that files an application or unsolicited proposal or otherwise requests EPA assistance. 40 C.F.R. §§ 5.105, 7.25. "Recipient" means any entity, other than applicant, which will actually receive EPA assistance. 40 C.F.R. §§ 5.105, 7.25. "Civil rights lawsuits and administrative complaints" means any lawsuit or administrative complaint alleging discrimination on the basis of race, color, national origin, sex, age, or disability pending or decided against the applicant and/or entity which actually benefits from the grant, but excluding employment complaints not covered by 40 C.F.R. Parts 5 and 7. For example, if a city is the named applicant but the grant will actually benefit the Department of Sewage, civil rights lawsuits involving both the city and the Department of Sewage should be listed. "Civil rights compliance review" means any review assessing the applicant's and/or recipient's compliance with laws prohibiting discrimination on the basis of race, color, national origin, sex, age, or disability. Submit this form with the original and required copies of applications, requests for extensions, requests for increase of funds, etc. Updates of information are all that are required after the initial application submission. If any item is not relevant to the project for which assistance is requested, write "NA" for "Not Applicable." In the event applicant is uncertain about how to answer any questions, EPA program officials should be contacted for clarification. * Note: Signature appears in the Approval Section of the EPA Comprehensive Administrative Review For Grants/Cooperative Agreements & Continuation/Supplemental Awards form.

EPA KEY CONTACTS FORM

OMB Number: 2030-0020
Expiration Date: 06/30/2024

Authorized Representative: *Original awards and amendments will be sent to this individual for review and acceptance, unless otherwise indicated.*

Name: Prefix: Mr. First Name: Mike Middle Name:
Last Name: Kane Suffix:
Title: President
Complete Address:
Street1: 216 Franklin St
Street2: Suite 400
City: Johnstown State: PA: Pennsylvania
Zip / Postal Code: 15901-1911 Country: USA: UNITED STATES
Phone Number: 814-225-1247 **Fax Number:**
E-mail Address: mkane@cfalleghenies.org

Payee: *Individual authorized to accept payments.*

Name: Prefix: Mr. First Name: Mike Middle Name:
Last Name: Kane Suffix:
Title: President
Complete Address:
Street1: 216 Franklin St
Street2: Suite 400
City: Johnstown State: PA: Pennsylvania
Zip / Postal Code: 15901-1911 Country: USA: UNITED STATES
Phone Number: 814-225-1247 **Fax Number:**
E-mail Address: mkane@cfalleghenies.org

Administrative Contact: *Individual from Sponsored Programs Office to contact concerning administrative matters (i.e., indirect cost rate computation, rebudgeting requests etc).*

Name: Prefix: Mr. First Name: Mike Middle Name:
Last Name: Kane Suffix:
Title: President
Complete Address:
Street1: 216 Franklin St
Street2: Suite 140
City: Johnstown State: PA: Pennsylvania
Zip / Postal Code: 15901-1911 Country: USA: UNITED STATES
Phone Number: 814-225-1247 **Fax Number:**
E-mail Address: mkane@cfalleghenies.org

EPA KEY CONTACTS FORM

Project Manager: *Individual responsible for the technical completion of the proposed work.*

Name: **Prefix:** Mr. **First Name:** Matthew **Middle Name:**

Last Name: Mehalik **Suffix:** Ph.D.

Title: Executive Director

Complete Address:

Street1: 1435 Bedford Ave

Street2: Suite 140

City: Pittsburgh **State:** PA: Pennsylvania

Zip / Postal Code: 15219 **Country:** USA: UNITED STATES

Phone Number: 412-514-5008 **Fax Number:**

E-mail Address: mmehalik@breatheproject.org

EPA Form 5700-54 (Rev 4-02)

BC•MAC
Beaver County Marcellus Awareness Community
P.O. Box 31, Ambridge, PA 15003

Matthew M. Mehalik, Ph.D.
Executive Director
Breathe Project
Energy Innovation Center
1435 Bedford Ave., Suite 140
Pittsburgh, PA 15219
412-514-5008
mmehalik@breatheproject.org

Dear Dr. Mehalik:

On behalf of Beaver County Marcellus Awareness Community (BCMAC), I would like to express support for your EPA Monitoring grant proposal titled "Monitoring of Chronic and Acute Pollution in the Upper Ohio River Valley."

This proposal brings together a resident team of impacted, environmental justice community members in the Upper Ohio River Valley, as well as air quality and health experts, ranging from air quality scientists, asthma researchers, and monitoring technology experts who are poised to monitor, assess, and take action to reduce health risks from ongoing and episodic air pollution in these impacted communities along the Upper Ohio River Valley.

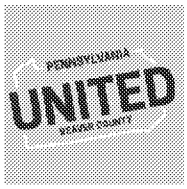
Beaver County Marcellus Awareness Community, formed by local citizens in 2011, seeks to protect the residents of Southwestern Pennsylvania, with emphasis on those in Beaver County, by informing them about the health, safety, environmental and economic impacts of fracking infrastructure, including the petrochemical buildout; and by supporting sustainable alternatives to carbon-based sources of economic development strategies in Beaver County.

The board and members of BCMAC are pleased and eager to engage in the work with regional groups outlined in this EPA grant proposal. We are committed to locating hosting sites for air monitors, disseminating information, leading and participating in community meetings to discuss monitor data and what findings reveal about health risks to the life of our community. We will also engage to lead enforcement campaigns to hold polluters accountable for ongoing and future pollution episodes in the Upper Ohio River Valley.

We look forward to working together on this project.

Sincerely,

Robert Schmetzer, Chair, Beaver County Marcellus Awareness Community (BCMAC)



Matthew M. Mehalik, Ph.D.
Executive Director
Breathe Project
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1435 Bedford Ave., Suite 140
Pittsburgh, PA 15219
412-514-5008
mmehalik@breatheproject.org

Dear Dr. Mehalik:

On behalf of Beaver County United, I would like to express support for your EPA Monitoring grant proposal titled "Monitoring of Chronic and Acute Pollution in the Upper Ohio River Valley."

This proposal brings together a resident team of impacted, environmental justice community members in the Upper Ohio River Valley, as well as air quality and health experts, ranging from air quality scientists, asthma researchers, and monitoring technology experts who are poised to monitor, assess, and take action to reduce health risks from ongoing and episodic air pollution in these impacted communities along the Upper Ohio River Valley.

PA United works to connect communities of color with white working-class communities in counties across Western PA around issues of equitable development with environmental protections, increasing the minimum wage, criminal justice reform, and support for workers organizing in unions. We organize with people by connecting issues with politics and building a multi-racial, working class movement for long-term change.

Beaver County United is pleased to join Beaver County Marcellus Awareness Community (BCMAC) and other regional groups in helping to locate hosting sites for air monitors, disseminating information about pollution's impacts on residents' health and discussing with our members what monitor data findings reveal about health risks to the life of our community. We will also engage and mobilize to support accountability and enforcement campaigns to hold polluters accountable for ongoing and future pollution episodes in the Upper Ohio River Valley.

We look forward to working together on this project.

Sincerely,

Martha Nwacukwu

Deputy Organizing Director, Northwest
Pennsylvania United
Beaver Office: 1417 Merchant St, Ambridge, PA 15003

March 22, 2022

Matthew M. Mehalik, Ph.D.
Executive Director
Breathe Project
Energy Innovation Center
1435 Bedford Ave., Suite 140
Pittsburgh, PA 15219
412-514-5008
mmehalik@breatheproject.org

Re: Support for Breathe Project's EPA Grant Application

Dear Dr. Mehalik:

Clean Air Council supports the Breathe Project's application for an EPA grant to develop in the Upper Ohio River Valley an air-quality monitoring system that will help to measure and address the additional pollution burden imposed on residents by the Shell Polymers Complex.

The Council recognizes that the Breathe Project's proposal, "Monitoring Chronic and Acute Pollution in the Upper Ohio River Valley," brings together a resident team of impacted environmental justice community members in the Upper Ohio River Valley, as well as air quality and health experts, including air quality scientists, asthma researchers, and monitoring technology experts who are poised to monitor, assess, and take action to reduce health risks from ongoing and episodic air pollution in these impacted communities along the Upper Ohio River Valley.

Clean Air Council is a member-supported environmental organization serving Pennsylvania. Dedicated to protecting and defending everyone's right to a healthy environment, the Council's team of policy analysts, planners, environmental health educators, engineers, attorneys, and community organizers works through a broad array of related sustainability, public health, and ecosystem protection initiatives. Using public education, community action, government oversight, and enforcement of environmental laws, the Council advocates for a cleaner environment, healthier lives for residents facing pollution, and the ability of residents to have meaningful input on the decisions that affect their health, environment, and quality of life.

The Council is a long-time partner of the Breathe Project and other project partners and collaborates with staff on a regular basis. The Council will support the proposed air monitoring project by providing an in-kind donation of staff time on technical advice and support on air monitors, placement, data interpretation, and community outreach. Specifically, the Council intends to offer the following support to bolster the proposed project:

- The Council's lawsuit on Shell's air permit for its proposed cracker plant resulted in Shell agreeing to install a robust fence line monitoring network at the site. Once the plant is operational, Shell is required to do fence line monitoring of pollution that leaves its site and make that information public on a website. Through three training sessions, Clean Air Council staff will train a team of 6-8 area residents on how to:

- regularly access and monitor that website to track Shell's fenceline monitoring data;
- understand when there is an exceedance of a harmful pollutant;
- report any exceedance to the appropriate entity; and
- communicate exceedances to the wider public to alert them about it.

* Train about 10 Beaver County residents, who have little trust in Shell-provided information, to use up to 10 provided or purchased monitors and an air monitor training manual to collect data on potential impacts to their air quality from cracker emissions in nearby residential areas. The Council will then help to analyze that data and draft a publicly accessible summary report on it.

* Assist the Breathe Project and partners in identifying gaps in the current monitoring network in the Ohio Valley. The Council recommends that a variety of new monitors (beyond the existing and inadequate network operated by government agencies) be placed in the Upper Ohio River Valley that runs through Beaver and Allegheny counties. The Council recommends prioritizing locations within a mile of the cracker plant and/or at the homes or facilities of nearby residents or municipal hosts who are dedicated to using the technology to alert and engage the public and the DEP about potential air quality issues that could result from petrochemical operations.

* Offer expertise in enforcement and regulatory issues that may arise as a result of the proposed monitoring network.

Please let me know if you have any questions about the Council's support for this proposal or the in-kind support we intend to provide. We look forward to working together on this project.

Singerely,

Matt Walker
Advocacy Director
Clean Air Council

Carnegie Mellon University
Department of Mechanical Engineering
5000 Forbes Ave
Wean Hall
Pittsburgh, PA 15213

Matthew M. Mehalik, Ph.D.
Executive Director
Breathe Project
Energy Innovation Center
1435 Bedford Ave., Suite 140
Pittsburgh, PA 15219
412-514-5008
mmehalik@breatheproject.org

Dear Dr. Mehalik:

On behalf of the Carnegie Mellon University Center for Atmospheric Particle Studies, I would like to express our commitment to contribute to the EPA Monitoring grant proposal titled "Monitoring Chronic and Acute Pollution in the Upper Ohio River Valley."

This proposal brings together a resident team of impacted, environmental justice community members in the Upper Ohio River Valley, as well as air quality and health experts, including air quality scientists, asthma researchers, and monitoring technology experts who are poised to monitor, assess, and take action to reduce health risks from ongoing and episodic air pollution in these impacted communities along the Upper Ohio River Valley.

We already collaborate closely with many of these residents. We maintain a network of low-cost air pollutant sensors across the Pittsburgh region, and a key focus area is the Ohio River Valley. These sensors are deployed in collaboration with area residents and community groups. We provide weekly reports on the sensor measurements, and present at community meetings to report out findings. In this project, we will continue to support the sensors in the Ohio River Valley and expand/adjust the network in accordance with community requests.

We look forward to working together on this project.

Sincerely,

Albert Presto
Research Professor
Department of Mechanical Engineering
Center for Atmospheric Particle Studies
Carnegie Mellon University

Mark Dixon
Project Manager
Community Monitoring Project
6437 Landview Rd.
Pittsburgh, PA 15217
415-672-5537

Matthew M. Mehalik, Ph.D.
Executive Director
Breathe Project
Energy Innovation Center
1435 Bedford Ave., Suite 140
Pittsburgh, PA 15219
412-514-5008
mmehalik@breatheproject.org

Dear Dr. Mehalik:

On behalf of the Community Monitoring Project, I would like to express my commitment to contribute to the EPA Monitoring grant proposal titled "Monitoring Chronic and Acute Pollution in the Upper Ohio River Valley."

This proposal brings together a resident team of impacted, environmental justice community members in the Upper Ohio River Valley, as well as air quality and health experts, including air quality scientists, asthma researchers, and monitoring technology experts who are poised to monitor, assess, and take action to reduce health risks from ongoing and episodic air pollution in these impacted communities along the Upper Ohio River Valley.

The Community Monitoring Project (CMP) is an initiative spearheaded and project managed by Mark Dixon and supported by a diverse group of community members to deploy 40 low-cost air monitors around the Shell Petrochemical Facility in Beaver, PA. The purpose of the CMP is to empower community members to keep a close eye on air quality conditions around the Shell Facility so they can better hold Shell accountable for public health and safety. Monitors include PurpleAir and Airviz units, both of which measure VOC and particulate levels (note: PurpleAir VOC readings are not yet formally supported but this raw data is available). Most of the monitors are already deployed (one PurpleAir and one Airviz monitor per site) and have been gathering baseline data prior to the start of full production at the Shell Facility. All monitor data is collected in near real-time, freely available to the public, and hosted conveniently at https://environmentaldata.org/ (EnvironmentalData.org is a project of the CREATE Lab at CMU). The CMP project plan includes funding of a report to be produced by the Environmental Health Project to analyze the air quality data from the monitors before and after Shell begins production.

(Funding Note: The Community Monitoring Project is funded by the Direct Support Fund. The Direct Support Fund is made possible by The Heinz Endowments and The 11th Hour Project and is a project of the Mountain Watershed Association. For more information or to apply please visit www.mtwatershed.com.)

Mark Dixon has extensive experience with low cost air monitors, particularly including the nuances of monitor deployment, maintenance, data visualization, and community engagement. He has facilitated the deployment of dozens of PurpleAir monitors throughout Allegheny County prior to the start of the CMP, and has developed a personal relationship with Adrian Dybwad, founder and CEO of PurpleAir. He also has a personal connection to the Pittsburgh-based Airviz team. Mark also attended the U.S. Environmental Protection Agency's Air Sensors 2018: Deliberating Performance Targets for Air Quality Sensors workshop at Triangle Park, North Carolina. With the help of community members near the Shell Facility, including Beaver County Marcellus Awareness Community (BCMAC), Mark has developed an extensive list of monitor host candidates in and around Beaver, PA – only some of which currently have a monitor. Mark plans to leverage this list to accelerate the process of finding monitor host candidates for this EPA Monitoring grant proposal. Mark also plans to leverage his monitor expertise and contacts in support of this grant proposal.

We look forward to working together on this project.

Sincerely,

Mark Dixon
Project Manager
Community Monitoring Project

CORAOPOLIS NAACP
P. O. BOX 844
CORAOPOLIS, PA. 15108

Executive Director
Breathe Project
Energy Innovation Center
1435 Bedford Ave., Suite 140
Pittsburgh, PA 15219
412-514-5008
mmehalik@breatheproject.org

Dear Dr. Mehalik:

On behalf of Coraopolis NAACP, I would like to express support for your EPA Monitoring grant proposal titled "Monitoring Chronic and Acute Pollution in the Upper Ohio River Valley."

This proposal brings together a resident team of impacted, environmental justice community members in the Upper Ohio River Valley, as well as air quality and health experts, ranging from air quality scientists, asthma researchers, and monitoring technology experts who are poised to monitor, assess, and take action to reduce health risks from ongoing and episodic air pollution in these impacted communities along the Upper Ohio River Valley.

The Coraopolis NAACP works to ensure the political, educational, social, and economic equality of rights of all persons and to eliminate racial hatred and racial discrimination. The organization includes a standing committee, the Environmental and Climate Justice Committee, which seeks to address environmental inequities at the local level and develop a comprehensive and holistic agenda to reduce pollution.

Coraopolis NAACP members have participated in conference calls with the group designing the project. We anticipate that our members will host monitors provided by this project. We understand that there will be an asthma registry associated with the project and predict that our members who are asthma suffers will be involved in that effort. We hope to have the project team make routine reports to our members at our monthly meetings to keep us apprised of the results and actions we can take to guard against adverse health impacts.

We look forward to working together on this project.

Sincerely,

Carter L. Spruill

Carter L. Spruill
President, Coraopolis NAACP #26AB-B
coraopolisnaacp@gmail.com
412 875-5400

Carnegie Mellon

Robotics Institute
5000 Forbes Ave., NSH 4629
Pittsburgh, PA 15213
Phone: (650) 575-1612
randy.sargent@cs.cmu.edu

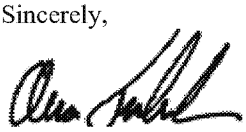
Matthew M. Mehalik, Ph.D.
Executive Director
Breathe Project
Energy Innovation Center
1435 Bedford Ave., Suite 140
Pittsburgh, PA 15219
412-514-5008
mmehalik@breatheproject.org

Dear Dr. Mehalik:

On behalf of Carnegie Mellon University CREATE Lab, I would like to express our commitment to contribute to the EPA Monitoring grant proposal titled "Monitoring Chronic and Acute Pollution in the Upper Ohio River Valley."

This proposal brings together a resident team of impacted, environmental justice community members in the Upper Ohio River Valley, as well as air quality and health experts, including air quality scientists, asthma researchers, and monitoring technology experts who are poised to monitor, assess, and take action to reduce health risks from ongoing and episodic air pollution in these impacted communities along the Upper Ohio River Valley.
Carnegie Mellon's CREATE lab is a community-focused technology empowerment and partnership organization. Our lab includes a diversity of skills, including technology development, research, education, and communications, among others. In the context of air quality, we try to publicly document pollution that damages all of our health. We collaborate on ways residents can combine voices to better document air pollution and to speak with amplified voices. We work together on ways to better monitor and understand pollution, adding to and visualizing the large network of air monitors set up and run by government agencies, universities, and residents alike. We work together to directly monitor some of our largest pollution sources, through 24/7 very high resolution time-lapse cameras, documenting fugitive emissions which are otherwise typically unmeasured. And some of our newest work combines monitoring with very detailed weather models to better understand who's exposed hour to hour and day to day from our large industrial sources. While our pollution sources can hope each day that by putting pollution into the atmosphere, the atmosphere will carry the pollution away from humans, but we see very graphically in these timelapse maps that weather and terrain in the Pittsburgh region make atmospheric transport often quite unfavorable, concentrating pollution in heavily populated areas. Relying on favorable atmospheric transport is a very poor plan for protecting us from pollution.
We intend to partner with the Breathe Project and the organizations and individuals working on the "Monitoring Chronic and Acute Pollution in the Upper Ohio River Valley" project. CREATE Lab will provide and maintain the Environmental Sensing Data Repository (ESDR) infrastructure service for aggregation of air monitor data. CREATE Lab will maintain websites, voc.createlab.org and environmentaldata.org as publicly accessible data access points throughout the course of the project. Lab staff will add new sensors acquired through the grant into these platforms, and iterate on platforms based on community, partner, and government stakeholder feedback. CREATE Lab will engage partners in the project and create tailored analyses and visualizations that can enhance reports, such as forward dispersion and back trajectory modeling.

Sincerely,



Ana Tsuhlares Hoffman she/her
Director of Air Quality Engagement
CREATE Lab

ENVIRONMENTAL HEALTH PROJECT
DEFENDING PUBLIC HEALTH 2012-2022
environmentalhealthproject.org

Matthew M. Mehalik, Ph.D.
Executive Director
Breathe Project
Energy Innovation Center
1435 Bedford Ave., Suite 140
Pittsburgh, PA 15219
412-514-5008
mmehalik@breatheproject.org

Dear Dr. Mehalik:

On behalf of the Environmental Health Project (EHP), I would like to express our commitment to contribute to the EPA Monitoring grant proposal titled "Monitoring Chronic and Acute Pollution in the Upper Ohio River Valley."

This proposal brings together a resident team of impacted, environmental justice community members in the Upper Ohio River Valley, as well as air quality and health experts, including air quality scientists, asthma researchers, and monitoring technology experts who are poised to monitor, assess, and take action to reduce health risks from ongoing and episodic air pollution in these impacted communities along the Upper Ohio River Valley.

The Environmental Health Project is a nonprofit public health organization that defends public health in the face of shale gas development. We collect, analyze, and present shale gas exposure information that informs frontline communities and empowers them to advocate for ending or mitigating harmful emissions. We work alongside individuals, communities, and health professionals to educate residents on exposure pathways and health impacts, and to promote the adoption of strategies that better protect them from shale gas pollution. We advocate for a health-protective approach to shale gas industry regulation that places health and wellbeing at the center of policy decisions and ensures safety and health for all.

EHP will provide data analysis through our AirView App to interpret and help communicate information collected by the air quality monitors deployed through this grant. Data analysis and interpretation, through AirView, will allow communities to determine the extent of extreme episodic exposures in their community, over time, and how that can impact their health.

We look forward to working together on this project.

Sincerely,

Jessa Chabeau

Jessa Chabeau, MSW
Regional Manager, Appalachia
Environmental Health Project

Community Partners in Asthma Care

Deborah Gentile MD
Medical Director

Community Partners in Asthma Care Inc
127 Lampliter Lane
McMurray, Pa 15317
EIN: 84-3284821

Matthew M. Mehalik, Ph.D.
Executive Director
Breathe Project
Energy Innovation Center
1435 Bedford Ave., Suite 140
Pittsburgh, PA 15219
412-514-5008
mmehalik@breatheproject.org

March 24, 2022

Dear Dr. Mehalik:

On behalf of Community Partners in Asthma Care (CPAC), a community based non-profit, I would like to express our commitment to contribute to the EPA Monitoring grant proposal titled "Monitoring Chronic and Acute Pollution in the Upper Ohio River Valley."

This proposal brings together a resident team of impacted, environmental justice community members in the Upper Ohio River Valley, as well as air quality and health experts, including air quality scientists, asthma researchers, and monitoring technology experts who are poised to monitor, assess, and take action to reduce health risks from ongoing and episodic air pollution in these impacted communities along the Upper Ohio River Valley.

CPAC's mission is to provide asthma education, research, and medical care to environmental justice communities. CPAC recently published two peer-reviewed studies that showed the impact of long-term exposure to air pollution on asthma prevalence and disease control in school children from environmental justice communities,[1] and the short-term impact of air pollution on out-patient and emergency department visits for asthma exacerbations in adults residing in an environmental justice community.[2] CPAC also runs a specialty asthma clinic in an environmental justice community impacted by air pollution and will adding 1-2 additional clinics in other environmental justice communities within the next calendar year.

CPAC will actively engage with the work of this proposal, including designing the project, examining/analyzing data, leading community health educational initiatives, participating in community meetings, and communicating outward to the larger community and policy makers. Specifically, CPAC will partner with the Department of Occupational and Environmental Health at the University of Pittsburgh School of Public Health to expand their existing Asthma Registry to include residents from the Upper Ohio River Valley. Their existing registry focuses on residents in Allegheny County, Pennsylvania, and was recently used to document increased asthma symptoms and rescue medication use among participants impacted by a recent air pollution exceedance event.[3] CPAC has received funding from a local foundation to enroll 500 residents of the Upper Ohio River Valley during the first year of this study and then will conduct follow-up visits annually and during any acute events of air pollution exposure. All participants will be geocoded and complete annual visits that include questions about their medical history and environmental exposures. They will perform breathing tests and agree to have their EMR information added to the registry. Once patients are enrolled in the study, they will be contacted for future studies if acute air pollution events occur in the Upper Ohio River Valley. This approach will allow the team to document the impact of both acute and chronic exposure to air pollution on asthma outcomes, including disease severity, disease control, quality of life and lung function.

Because the work to initiate an Asthma Registry among residents of the Upper Ohio River Valley is already funded, this work will be offered in kind on this project. Annual in-kind support for the Asthma Registry among residents of the Upper Ohio River Valley totals $155,000. An itemized breakdown of annual in-kind costs is summarized below.

Personnel (Salary and Fringes)
Community Partners in Asthma Care
Deborah Gentile, MD, Project Leader (20% effort) $45,000

Subcontract
Department of Occupational and Environmental Health
University of Pittsburgh School of Public Health

Research Coordinator (50% effort)	$35,000
Data Manager (20% effort)	$15,000
Administrative Assistant (20% effort)	$7,500

Statistical Consultant

Morphew Consulting LLC	$20,000

Participant Incentives ($50/participant x 500)	$25,000
Community Outreach	$5,000
Spirometry Supplies	$2,500

CPAC is well positioned to engage in this work since we have an established track record of successfully completing such community-based health studies. Additionally, as medical director of CPAC, I have over 25 years of experience in conducting clinical research and have published 70 peer-reviewed manuscripts describing research results. I also have an adjunct appointment in the Department of Occupational & Environmental Health at the Graduate School of Public Health at the University of Pittsburgh which will facilitate completion of the proposed Asthma Registry work.

CPAC looks forward to working together on this project.

Sincerely,

Deborah Gentile, MD

Deborah Gentile, MD
Medical Director
Community Partners in Asthma Care

References:

1.Gentile D, Morphew T, Elliott J, et al. Asthma prevalence and control among schoolchildren residing near outdoor air pollution sites. *J Asthma* 2020;Nov 5;1-11. doi:10.1080/02770903.2020.1840584.

2. Morphew T, Venkat A, Graham J, et al (including Gentile D). Impact of a large fire and subsequent pollution control failure at a coke works on acute asthma exacerbations in nearby adults. *Toxics* 2021;9:147. doi:10.3390/toxics9070147.

3. Byrwa-Hill B, Presto A, Wenzel S, Fabisiak J. Impact of a pollution breach at a coke oven factory on asthma control in nearby vulnerable adults. *J Allergy Clin Immunol* 2021;148:225. Doi:10.1016/j.jaci.2021.04.011

Communities First ~ SEWICKLEY VALLEY

Communities First Sewickley Valley
c/o The Breathe Project
1435 Bedford Avenue, Suite 140
Pittsburgh PA 15219

March 23, 2022

Communities First Sewickley Valley (C1) represents the 11 municipalities located 12 miles downriver from the site of the Shell Polymer plant in Beaver County and 12 miles north-west of the city of Pittsburgh.

The Purple Airs currently located here show when the air pollution is coming from a local source. Neville Island is a nearby manufacturing site on the Ohio River adjacent to our southern communities. When there is a trend or pattern of Purple Airs showing red alerts, they either originate from sources in Pittsburgh or from Beaver County.

The funding from the grant would provide site-specific monitors to measure the ozone settling in the valleys. It would enable us to have a centralized method to collaborate on the long and short term episodic data. We currently lack personnel to provide maintenance and upkeep up the monitors. Funding for enhanced communications would engage and inform the public. Collecting health data will help measure current environmental conditions and their impact. Overall, air monitoring is a proactive measure citizens can take to maintain and determine our quality of life.

Sincerely,

Gail Murray
Director of Communications,
Communities First Sewickley Valley

Doug Krings
Principal,
Krings & Associates LLC

Lew Benson
Principal Consultant,
Benson Environmental LLC

National Association for the Advancement of Colored People - NAACP
Beaver County Branch Number 2372
524 Franklin Avenue
AAUD Franklin Center
Aliquippa, PA 15001

Matthew M. Mehalik, Ph.D.
Executive Director
Breathe Project
Energy Innovation Center
1435 Bedford Ave., Suite 140
Pittsburgh, PA 15219
412-514-5008
mmehalik@breatheproject.org

Dear Dr. Mehalik:

On behalf of Beaver County NAACP, I would like to express support for your EPA Monitoring grant proposal titled "Monitoring of Chronic and Acute Pollution in the Upper Ohio River Valley."

This proposal brings together a resident team of impacted, environmental justice community members in the Upper Ohio River Valley, as well as air quality and health experts, ranging from air quality scientists, asthma researchers, and monitoring technology experts who are poised to monitor, assess, and take action to reduce health risks from ongoing and episodic air pollution in these impacted communities along the Upper Ohio River Valley.

Together with more than 2 million activists across the country, the NAACP works to ensure the political, educational, social and economic equality of rights of all persons and to eliminate racial hatred and racial discrimination.

The Beaver County NAACP is pleased to join Beaver County Marcellus Awareness Community (BCMAC) and other regional groups in helping to locate hosting sites for air monitors, disseminating information about pollution impacts and discussing monitor data findings with our membership. We will also engage and mobilize to support accountability and enforcement campaigns to hold polluters accountable for ongoing and future pollution episodes in the Upper Ohio River Valley.

We look forward to working together on this project.

Sincerely,

Mtume Imani

Mtume Imani, President, Beaver County NAACP

Protect Franklin Park
https://www.facebook.com/protectfranklinpark/
March 22, 2022

Matthew M. Mehalik, Ph.D.
Executive Director
Breathe Project
Energy Innovation Center
1435 Bedford Ave., Suite 140
Pittsburgh, PA 15219
mmehalik@breatheproject.org

Dear Dr. Mehalik:

On behalf of our organization *Protect Franklin Park*, we are writing to confirm our support for your EPA Monitoring grant proposal titled "Monitoring of Chronic and Acute Pollution in the Upper Ohio River Valley."

We will inform the residents and local officials of Franklin Park Borough and neighboring communities about air quality issues in the Upper Ohio River Valley and about the proposed air quality monitoring project.

Franklin Park Borough is primarily a residential community located on the eastern side of the Upper Ohio River Valley. Winds from Beaver County and other areas west and northwest of our community frequently affect our air.

Protect Franklin Park is a community-based organization dedicated to protecting the health, safety, and well-being of Franklin Park Borough residents through information, action, and advocacy. We are organized as a group of volunteers who study and share information about health and environmental risks that impact our residents.

We currently focus on health risks associated with air and noise pollution caused by vehicles on PA Interstate 79 (which passes through Franklin Park Borough) and with flare-ups of air-born fine particulate matter (PM 2.5) coming from industries on the Upper Ohio River as well as from elsewhere in the greater Pittsburgh area. We expect air pollutants emitted by the Shell ethane cracker plant nearby in Beaver County (about 18 miles northwest of our borough) to have a major impact on our air quality.

We have worked with our local council to install a *PurpleAir* monitor in a public recreational area near PA I-79 and are looking for support to install more monitors near our borough's western and northwestern boundaries. We are advocating for the inclusion of air quality monitoring in the multi-municipal plan being developed by Franklin Park Borough and Ohio Township. Increased monitoring and scientifically reliable information about air quality in the Upper Ohio Valley will greatly assist us in our local advocacy.

Sincerely,

Founding Members of Protect Franklin Park

Thaddeus Popovich
Retired Marketing Executive and
Cofounder of Allegheny Clean Air Now (ACCAN)
tedpop32@icloud.com

Patrick J. Pagano, Ph.D.
Professor of Pharmacology
University of Pittsburgh
pjpagano1@gmail.com

Carol L. Hoover, Ph.D.
President & CEO of BiznessLegion, LLC
carollhoover@msn.com

University of Pittsburgh | Environmental and Occupational Health School of Public Health

March 21, 2022

Matthew M. Mehalik, Ph.D.
Executive Director
Breathe Project
Energy Innovation Center
1435 Bedford Ave., Suite 140
Pittsburgh, PA 15219
412-514-5008
mmehalik@breatheproject.org

Dear Dr. Mehalik:

On behalf of the Environmental and Occupational Health (EOH) Department at the University of Pittsburgh School of Public Health (Pitt Public Health) and the University of Pittsburgh Asthma and Environmental Lung Health Institute (AELHI), I am pleased to express our commitment to contribute to the EPA Monitoring grant proposal entitled "Monitoring Chronic and Acute Pollution in the Upper Ohio River Valley."

This proposal brings together a team of environmental justice community members in the Upper Ohio River Valley who are and will be heavily impacted by local pollutants, air quality and health experts, including air quality scientists, asthma researchers, and monitoring technology experts. This resident team is uniquely poised to monitor, assess, and then take action to reduce health risks from ongoing and episodic air pollution in these impacted communities along the Upper Ohio River Valley.

Pitt Public Health is recognized for significant contributions to research in multiple areas of public health on the local, national and international levels. Our faculty is actively involved in expanding knowledge in the public health field through scientific inquiry and innovation, with the school having a rich history of conducting groundbreaking studies, from collaborating on the development of the polio vaccine in the 1950s to the timely studies of HIV/AIDS in the 1980s, to today's virtual modeling of the spread of infectious disease. This proposal aligns closely with several goals of EOH, including identification of agents that affect health and study of the long-term effects of environmental health risks.

The University of Pittsburgh AELHI is dedicated to improving the health and wellness of patients with asthma and other environmentally-linked lung diseases. This Institute is dedicated to both clinical and personal level epidemiologic studies. Our mission is to improve the understanding (and prevention or treatment) of asthma, its worsening and its treatment through community outreach, education and research. We are home to the Asthma Institute Research Registry (AIR). AIR has enrolled over 2,000 patients from our region who are richly characterized using questionnaires, pulmonary function testing and available blood samples. Their registry data can

be enhanced by electronic medical record (EMR) links as well, which capture asthma exacerbations. Participants that agree to allow researchers to contact them about future research study opportunities, including timely surveys based around COVID19, as well as a recent publication regarding the health impacts of the fire in the pollution control room of the US Steel Coke plant in Clairton, PA.[1] We have recently invested in a highly versatile and flexible new database system allowing us to follow our participants on a yearly basis and as acute needs arise. In addition to these large scale registry-related trials, our team is heavily involved in utilizing a personalized care approach to provide research (but clinically focused) opportunities for participants with mild to severe asthma. We offer the latest advances in diagnostic testing including spirometry, lung volumes, methacholine challenge and other pulmonary function methods. our goals are to advance the understanding of asthma and the treatment of asthma, and to learn more about how our physical social, environmental, cultural, and genetic factors affect the heath of patients with asthma.

Our team at EOH has received funding to expand AIR to enroll and follow 500 patients with asthma residing in the Upper Ohio River Valley. All participants will be geocoded and complete annual visits that include questions about their medical history and environmental exposures. They will perform breathing tests and agree to have their EMR information added to the registry. Once patients are enrolled in the study, they will be contacted for future studies if acute air pollution events occur in the Upper Ohio River Valley. This approach will allow our team to study the impact of both long-term and short-term exposure to air pollution on asthma outcomes in this population.

EOH will actively engage with the work of this proposal, including designing the project, examining/analyzing data, participating in community health educational initiatives and meetings, and communicating outward to the larger community and policy makers. EOH is receiving separate funds to perform broad community assessments from non-asthmatic participants through foundation funding sources, as well as to collect soil, water samples. Thus, this is a perfect partnership between foundations, academia tied together by EPA funding. EOH and the University of Pittsburgh AELHI look forward to working with all its partners on this project.

Sincerely,

Sally E. Wenzel, MD
Chair, Department of Environmental and Occupational Health
Rachel Carson Endowed Chair in Environmental Health
Director, Asthma and Environmental Lung Health Institute
Professor of Medicine and Immunology
University of Pittsburgh

Reference:

1. Byrwa-Hill B, Presto A, Wenzel S, Fabisiak J. Impact of a pollution breach at a coke oven factory on asthma control in nearby vulnerable adults. *J Allergy Clin Immunol* 2021;148:225. Doi:10.1016/j.jaci.2021.04.011

University of Pittsburgh

Graduate School of Public Health
Department of Environmental and Occupational Health

130 De Soto Street
Pittsburgh, PA 15261-5718
412-383-7700
Fax: 412-624-9361

March 18, 2022

Matthew M. Mehalik, Ph.D.
Executive Director
Breathe Project
Energy Innovation Center
1435 Bedford Ave., Suite 140
Pittsburgh, PA 15219
412-514-5008
mmehalik@breatheproject.org

Dear Matt:

The purpose of this letter is to indicate our Center's enthusiastic support for and commitment to your EPA Monitoring grant proposal entitled "Monitoring Chronic and Acute Pollution in the Upper Ohio River Valley."

As we have discussed many times, a proposal that brings together a partnership of community residents from impacted and environmental justice communities in the Upper Ohio River Valley, along with university-based and other professionals with air quality and environmental health expertise would be the most effective way promote a community-centric process for assessing and interpreting air pollution trends and impacts, as well as, efficiently mobilize to develop risk-mitigating and health-promoting strategies when appropriate. As I am sure the proposal illustrates, the Upper Ohio River Valley has a long history of heavy industrial activity, and a legacy of air pollution, as well as being the future site for additional new sources of air emissions, most notable being new petrochemical facilities and their upstream and downstream associated buildout. It's historical lack of any high-density air monitoring coverage and community-based initiatives make the Upper Ohio River Valley a high priority for this project.

As you know our Center for Healthy Environments and Communities (CHEC), housed with the University of Pittsburgh School of Public Health has been a member and resource for the Breathe Collaborative for over a decade. The overall mission of CHEC is to *apply a data-and fact-based approach to understand regional environmental health issues and make them accessible to concerned stake-holders*. As you know the Center has taken part in many meetings, initiatives, and events in conjunction with you and your collaborative. In addition, we also published several papers and reports describing air pollution and environmental health issues in a regional-specific context, which I know have been used to support the advocacy work of others in your group (see below).

Michanowicz, D., et al. *Pittsburgh Regional Environmental Threat Analysis (PRETA) Air: Hazardous Air Pollutants*. Prepared by Center of Healthy Environments and Communities (CHEC), University of Pittsburgh, Commissioned by the Heinz Endowments. http://www.heinz.org/UserFiles/Library/PRETA_HAPS.pdf

Fabisiak, J.P., et al. A risk-based model to assess environmental justice and coronary heart disease burden from traffic-related air pollutants. Environ. Health, 19:34, 2020 https://doi.org/10.1186/s12940-020-00584-z)

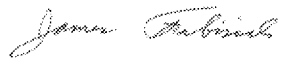
Byrwa-Hill, B.M., et al. Impact of a pollution breach at a coke oven factory on asthma control in nearby vulnerable adults. J. Allergy Clin. Immunol., 148:225, Apr 21, 2021. https://www.jacionline.org/article/S0091-6749(21)00649-7/fulltext

CHEC would be happy to provide any help we can to further this important work. As expected with any good community-based project specific research questions often evolve organically over time, especially when they originate from residents themselves. While you have enlisted others with significant expertise in air monitoring, low-cost sensors, and air quality monitoring, I think CHEC's emphasis could be in providing a robust connection of these data to the actual and potential health-related risks. This could range from using simple risk-based models to illustrate the magnitude of health risks associated with the patterns and changes of air quality observed during the course of your monitoring, to more sophisticated health tracking and surveillance protocols using electronic medical records (UPMC, our affiliated School of Medicine, is one of the largest health care providers in the area), as well as,

our more specialized patient registries such as the Asthma Registry maintained at our Asthma Environmental Lung Health Institute.

I look forward to working together with you on this project.

Sincerely,



James P. Fabisiak, Ph.D.
Associate Professor of Environmental Health
Director, Center for Healthy Environments and Communities
Department of Environmental & Occupational Health
School of Public Health, PUBHL-4132
University of Pittsburgh
130 DeSoto Street
Pittsburgh, PA 15261

Phone: 412-624-7335
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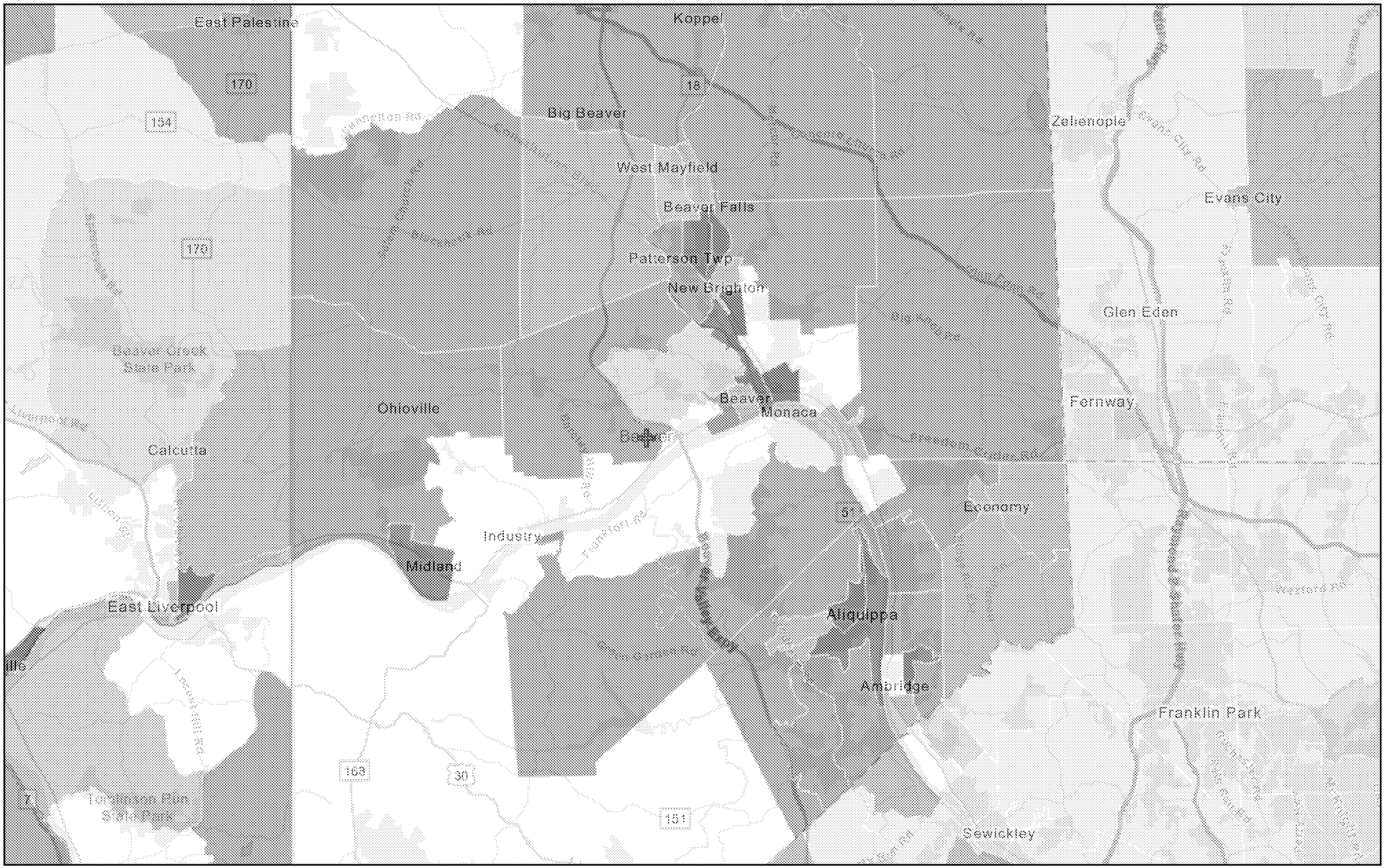
E-mail: fabs@pitt.edu

Upper Ohio River Valley Asthma



3/21/2022

1:288,895

0 1.75 3.5 7 mi

0 3 6 12 km

Search Result (point)

Current Asthma

Less than 50%ile

50-60%ile

60-70%ile

70-80%ile

80-90%ile

90-95%ile

95-100%ile

data.pa.gov, Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, EPA, NPS, USDA

Upper Ohio River Valley Heart Disease

3/21/2022

Coronary Heart Disease

- Less than 50%ile
- 50-60%ile
- 60-70%ile
- 70-80%ile
- 80-90%ile
- 90-95%ile
- 95-100%ile
- Search Result (point)

1:288,895

0 1.75 3.5 7 mi

0 3 6 12 km

data.pa.gov, Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, EPA, NPS, USDA

Upper Ohio River Valley Low Life Expectancy

3/21/2022

Low Life Expectancy

- Less than 50%ile
- 50-60%ile
- 60-70%ile
- 70-80%ile
- 80-90%ile
- 90-95%ile
- 95-100%ile
- Search Result (point)

1:288,895

0 1.75 3.5 7 mi

0 3 6 12 km

data.pa.gov, Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, EPA, NPS, USDA

ED_013931A_00001104-00003

Save as PDF

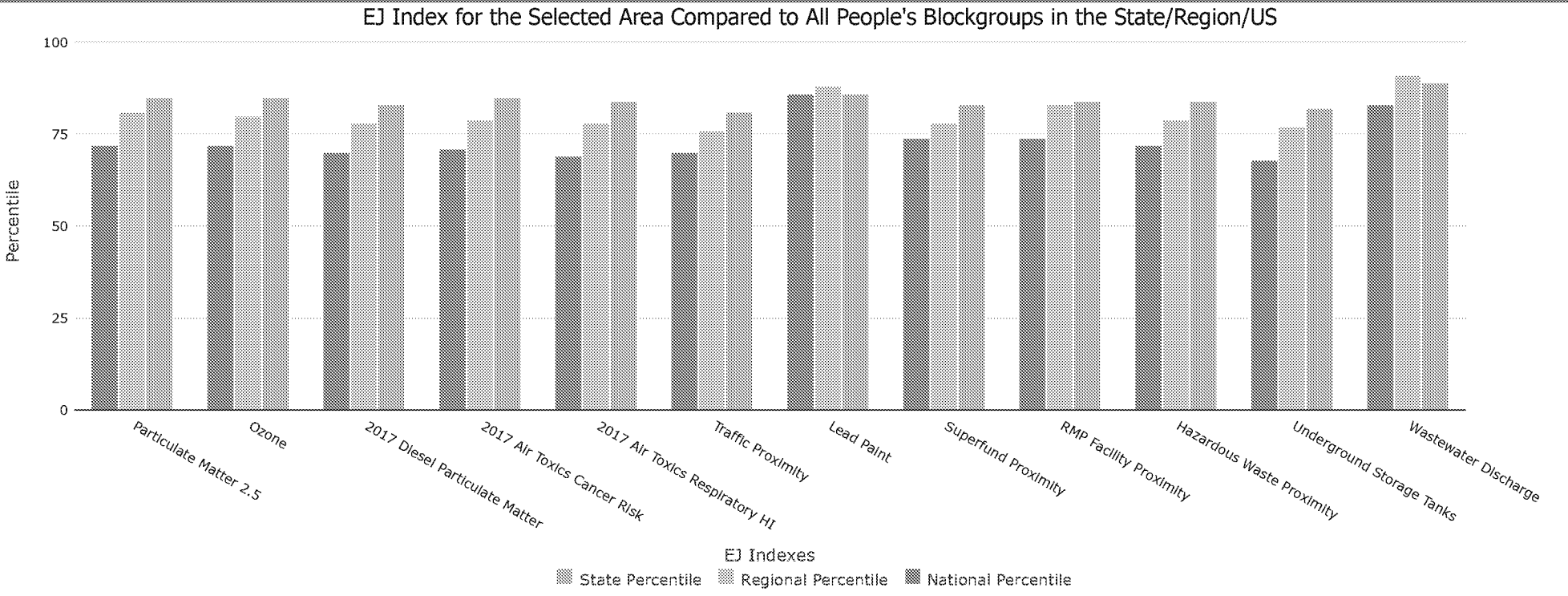
EJScreen Report (Version 2.0)

City: Aliquippa
PENNSYLVANIA, EPA Region 3
Approximate Population: 9,004
Input Area (sq. miles): 4.60

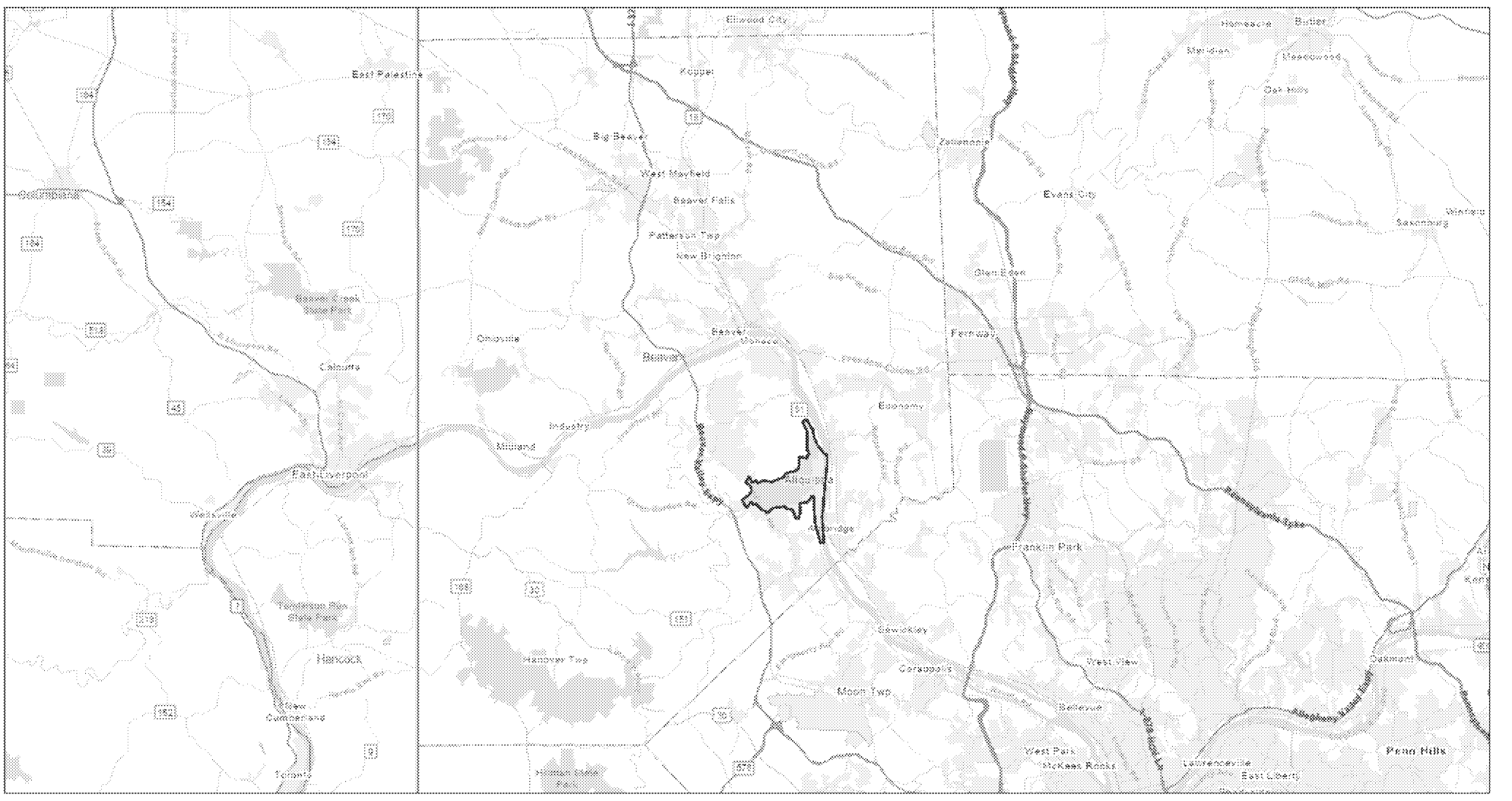
Aliquippa, PA

Selected Variables	Percentile in State	Percentile in EPA Region	Percentile in USA
Environmental Justice Indexes			
EJ Index for Particulate Matter 2.5	85	81	72
EJ Index for Ozone	85	80	72
EJ Index for 2017 Diesel Particulate Matter*	83	78	70
EJ Index for 2017 Air Toxics Cancer Risk*	85	79	71
EJ Index for 2017 Air Toxics Respiratory HI*	84	78	69
EJ Index for Traffic Proximity	81	76	70
EJ Index for Lead Paint	86	88	86
EJ Index for Superfund Proximity	83	78	74
EJ Index for RMP Facility Proximity	84	83	74
EJ Index for Hazardous Waste Proximity	84	79	72
EJ Index for Underground Storage Tanks	82	77	68
EJ Index for Wastewater Discharge	89	91	83

EJ Index for the Selected Area Compared to All People's Blockgroups in the State/Region/US



This report shows the values for environmental and demographic indicators and EJScreen indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJScreen documentation for discussion of these issues before using reports.



March 21, 2022
Aliquippa, PA

1:288,895
0 2.75 5.5 11 mi
0 4.25 8.5 17 km

data.pa.gov, Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, EPA, NPS, USDA

Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	1

Selected Variables	Value	State		EPA Region		USA	
		Avg.	%tile	Avg.	%tile	Avg.	%tile
Pollution and Sources							
Particulate Matter 2.5 ($\mu g/m^3$)	9.24	8.72	77	8.2	90	8.74	68
Ozone (ppb)	45.3	42.1	99	41.9	93	42.6	78
2017 Diesel Particulate Matter* ($\mu g/m^3$)	0.223	0.269	39	0.267	<50th	0.295	<50th
2017 Air Toxics Cancer Risk* (lifetime risk per million)	30	31	84	30	80-90th	29	80-90th
2017 Air Toxics Respiratory HI*	0.3	0.32	67	0.34	50-60th	0.36	<50th
Traffic Proximity (daily traffic count/distance to road)	290	580	53	680	53	710	56
Lead Paint (% Pre-1960 Housing)	0.73	0.47	76	0.35	85	0.28	90
Superfund Proximity (site count/km distance)	0.07	0.19	38	0.15	44	0.13	54
RMP Facility Proximity (facility count/km distance)	0.43	0.81	50	0.63	61	0.75	56
Hazardous Waste Proximity (facility count/km distance)	0.9	1.4	58	1.9	57	2.2	54
Underground Storage Tanks (count/km^2)	1.9	3.4	58	2.7	63	3.9	57
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.0067	66	61	33	71	12	66
Socioeconomic Indicators							
Demographic Index	49%	26%	84	30%	81	36%	72
People of Color	43%	24%	81	33%	68	40%	60
Low Income	55%	28%	88	27%	90	31%	84
Unemployment Rate	9%	5%	83	5%	83	5%	81
Linguistically Isolated	2%	2%	69	3%	66	5%	54
Less Than High School Education	11%	9%	65	10%	63	12%	56
Under Age 5	4%	6%	35	6%	33	6%	30
Over Age 64	21%	18%	67	16%	72	16%	76

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's 2017 Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

For additional information, see: www.epa.gov/environmentaljustice

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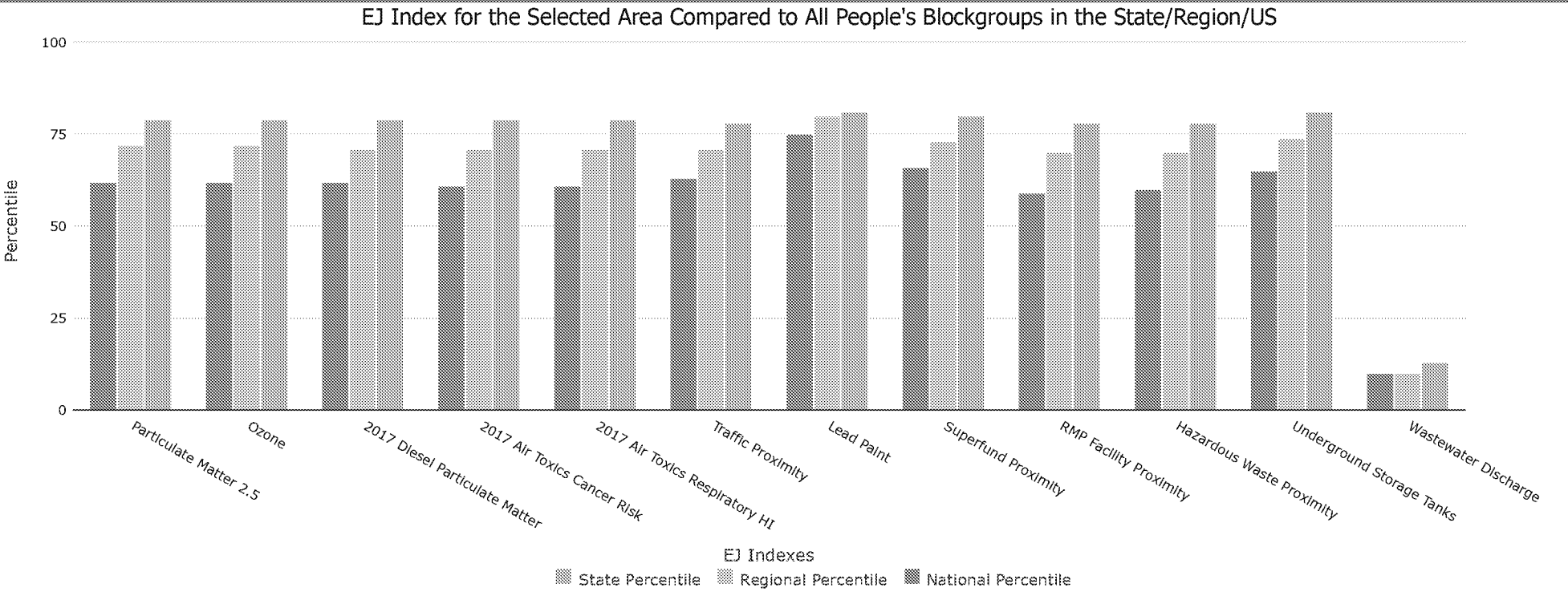
EJScreen Report (Version 2.0)

City: Ambridge borough
PENNSYLVANIA, EPA Region 3
Approximate Population: 6,707
Input Area (sq. miles): 1.69

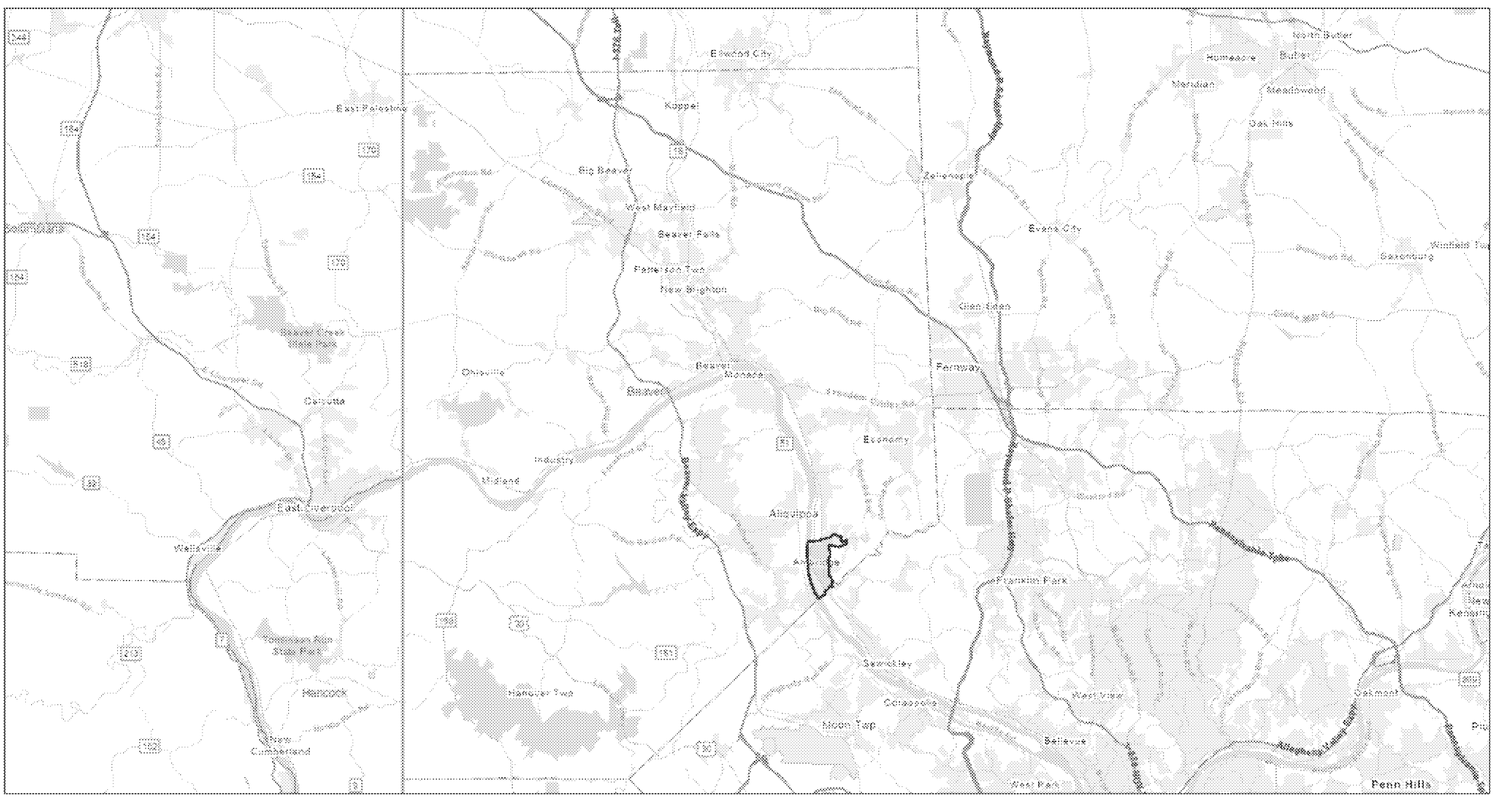
Ambridge

Selected Variables	Percentile in State	Percentile in EPA Region	Percentile in USA
Environmental Justice Indexes			
EJ Index for Particulate Matter 2.5	79	72	62
EJ Index for Ozone	79	72	62
EJ Index for 2017 Diesel Particulate Matter*	79	71	62
EJ Index for 2017 Air Toxics Cancer Risk*	79	71	61
EJ Index for 2017 Air Toxics Respiratory HI*	79	71	61
EJ Index for Traffic Proximity	78	71	63
EJ Index for Lead Paint	81	80	75
EJ Index for Superfund Proximity	80	73	66
EJ Index for RMP Facility Proximity	78	70	59
EJ Index for Hazardous Waste Proximity	78	70	60
EJ Index for Underground Storage Tanks	81	74	65
EJ Index for Wastewater Discharge	13	10	10

EJ Index for the Selected Area Compared to All People's Blockgroups in the State/Region/US



This report shows the values for environmental and demographic indicators and EJScreen indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJScreen documentation for discussion of these issues before using reports.



March 21, 2022
Ambridge

1:288,895
0 2.75 5.5 11 mi
0 4.25 8.5 17 km

data.pa.gov, Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, EPA, NPS, USDA

Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	1

Selected Variables	Value	State		EPA Region		USA	
		Avg.	%tile	Avg.	%tile	Avg.	%tile
Pollution and Sources							
Particulate Matter 2.5 ($\mu g/m^3$)	9.3	8.72	80	8.2	92	8.74	69
Ozone (ppb)	45.3	42.1	99	41.9	93	42.6	78
2017 Diesel Particulate Matter* ($\mu g/m^3$)	0.224	0.269	40	0.267	<50th	0.295	<50th
2017 Air Toxics Cancer Risk* (lifetime risk per million)	30	31	84	30	80-90th	29	80-90th
2017 Air Toxics Respiratory HI*	0.3	0.32	67	0.34	50-60th	0.36	<50th
Traffic Proximity (daily traffic count/distance to road)	580	580	72	680	69	710	72
Lead Paint (% Pre-1960 Housing)	0.85	0.47	88	0.35	92	0.28	95
Superfund Proximity (site count/km distance)	0.099	0.19	49	0.15	57	0.13	66
RMP Facility Proximity (facility count/km distance)	0.54	0.81	56	0.63	66	0.75	61
Hazardous Waste Proximity (facility count/km distance)	1.3	1.4	67	1.9	65	2.2	61
Underground Storage Tanks (count/km^2)	1.8	3.4	57	2.7	61	3.9	56
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.28	66	87	33	90	12	89
Socioeconomic Indicators							
Demographic Index	37%	26%	78	30%	70	36%	60
People of Color	25%	24%	70	33%	52	40%	43
Low Income	49%	28%	84	27%	86	31%	79
Unemployment Rate	5%	5%	54	5%	54	5%	52
Linguistically Isolated	1%	2%	62	3%	59	5%	48
Less Than High School Education	7%	9%	49	10%	48	12%	43
Under Age 5	6%	6%	57	6%	54	6%	50
Over Age 64	15%	18%	36	16%	44	16%	51

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's 2017 Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

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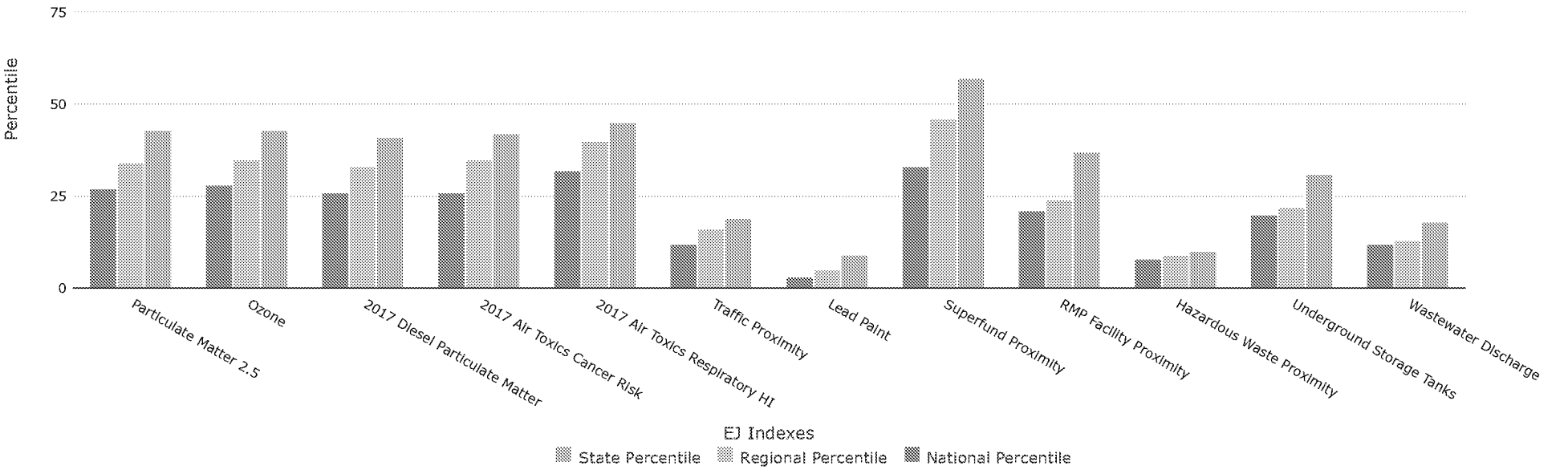
EJScreen Report (Version 2.0)

City: Beaver borough
PENNSYLVANIA, EPA Region 3
Approximate Population: 4,334
Input Area (sq. miles): 1.12

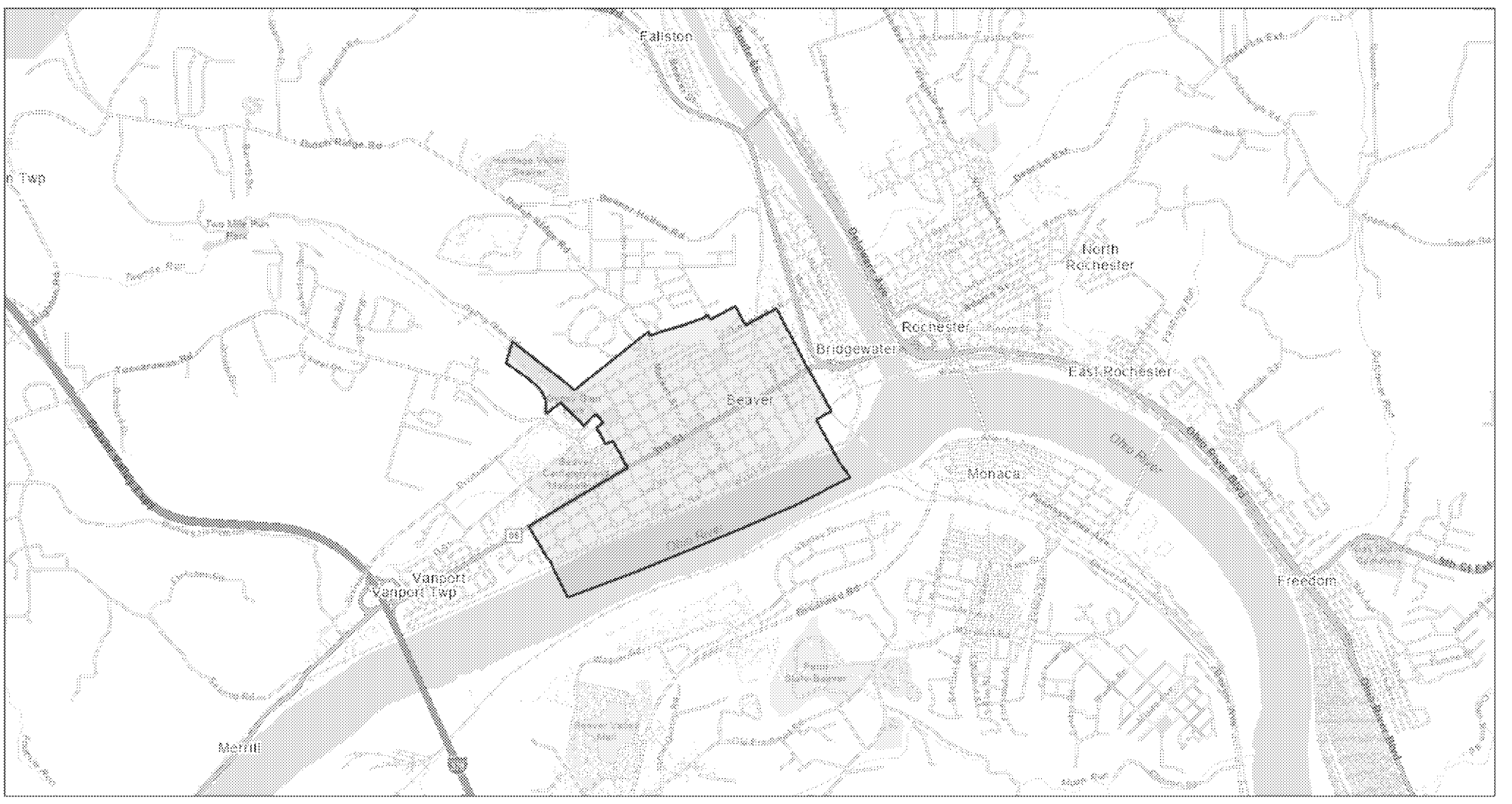
Beaver

Selected Variables	Percentile in State	Percentile in EPA Region	Percentile in USA
Environmental Justice Indexes			
EJ Index for Particulate Matter 2.5	43	34	27
EJ Index for Ozone	43	35	28
EJ Index for 2017 Diesel Particulate Matter*	41	33	26
EJ Index for 2017 Air Toxics Cancer Risk*	42	35	26
EJ Index for 2017 Air Toxics Respiratory HI*	45	40	32
EJ Index for Traffic Proximity	19	16	12
EJ Index for Lead Paint	9	5	3
EJ Index for Superfund Proximity	57	46	33
EJ Index for RMP Facility Proximity	37	24	21
EJ Index for Hazardous Waste Proximity	10	9	8
EJ Index for Underground Storage Tanks	31	22	20
EJ Index for Wastewater Discharge	18	13	12

EJ Index for the Selected Area Compared to All People's Blockgroups in the State/Region/US



This report shows the values for environmental and demographic indicators and EJScreen indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJScreen documentation for discussion of these issues before using reports.



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0

Selected Variables	Value	State		EPA Region		USA	
		Avg.	%tile	Avg.	%tile	Avg.	%tile
Pollution and Sources							
Particulate Matter 2.5 ($\mu g/m^3$)	9.18	8.72	71	8.2	88	8.74	66
Ozone (ppb)	45.2	42.1	96	41.9	91	42.6	76
2017 Diesel Particulate Matter* ($\mu g/m^3$)	0.24	0.269	45	0.267	<50th	0.295	<50th
2017 Air Toxics Cancer Risk* (lifetime risk per million)	30	31	84	30	80-90th	29	80-90th
2017 Air Toxics Respiratory HI*	0.3	0.32	67	0.34	50-60th	0.36	<50th
Traffic Proximity (daily traffic count/distance to road)	510	580	69	680	66	710	69
Lead Paint (% Pre-1960 Housing)	0.81	0.47	84	0.35	90	0.28	93
Superfund Proximity (site count/km distance)	0.042	0.19	18	0.15	23	0.13	36
RMP Facility Proximity (facility count/km distance)	0.41	0.81	49	0.63	61	0.75	55
Hazardous Waste Proximity (facility count/km distance)	2.7	1.4	84	1.9	79	2.2	76
Underground Storage Tanks (count/km^2)	1.4	3.4	53	2.7	57	3.9	52
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.022	66	73	33	80	12	75
Socioeconomic Indicators							
Demographic Index	15%	26%	37	30%	26	36%	19
People of Color	6%	24%	33	33%	21	40%	13
Low Income	24%	28%	49	27%	52	31%	43
Unemployment Rate	6%	5%	65	5%	65	5%	63
Linguistically Isolated	0%	2%	58	3%	56	5%	45
Less Than High School Education	3%	9%	17	10%	17	12%	16
Under Age 5	4%	6%	39	6%	36	6%	34
Over Age 64	26%	18%	84	16%	86	16%	88

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's 2017 Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

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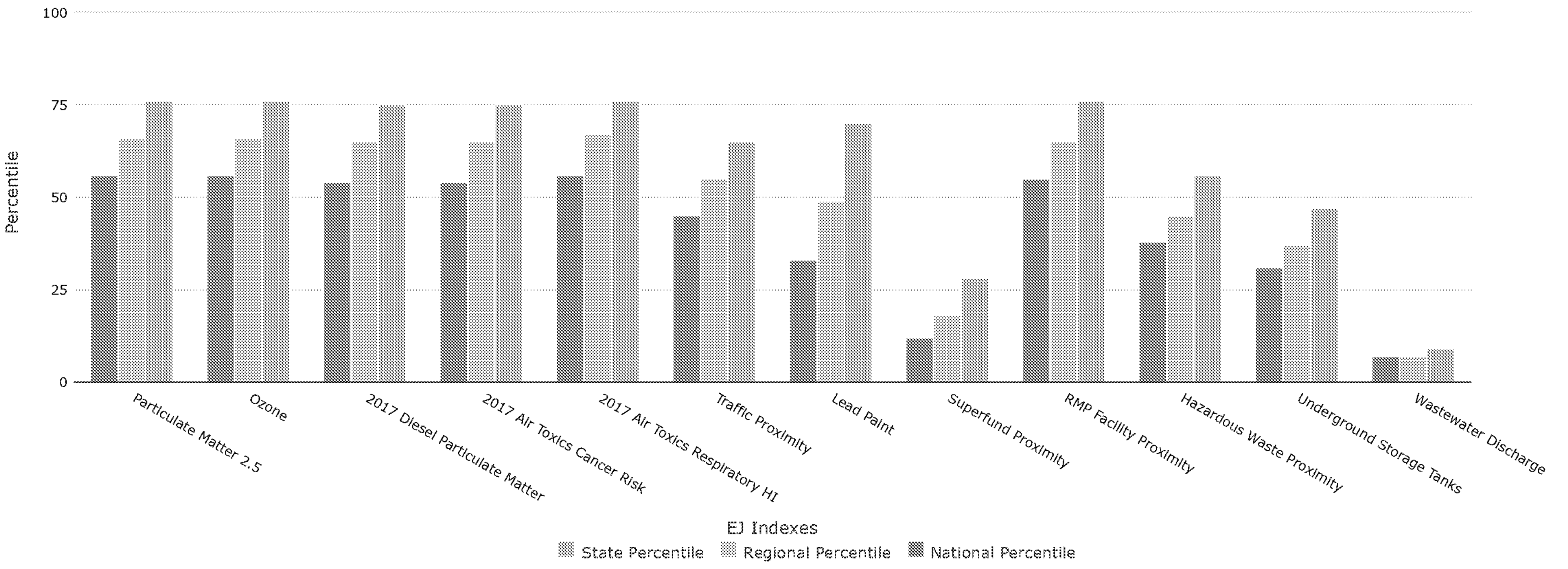
EPA United States Environmental Protection Agency

EJScreen Report (Version 2.0)

City: Coraopolis borough
PENNSYLVANIA, EPA Region 3
Approximate Population: 5,488
Input Area (sq. miles): 1.46
Coraopolis

Selected Variables	Percentile in State	Percentile in EPA Region	Percentile in USA
Environmental Justice Indexes			
EJ Index for Particulate Matter 2.5	76	66	56
EJ Index for Ozone	76	66	56
EJ Index for 2017 Diesel Particulate Matter*	75	65	54
EJ Index for 2017 Air Toxics Cancer Risk*	75	65	54
EJ Index for 2017 Air Toxics Respiratory HI*	76	67	56
EJ Index for Traffic Proximity	65	55	45
EJ Index for Lead Paint	70	49	33
EJ Index for Superfund Proximity	28	18	12
EJ Index for RMP Facility Proximity	76	65	55
EJ Index for Hazardous Waste Proximity	56	45	38
EJ Index for Underground Storage Tanks	47	37	31
EJ Index for Wastewater Discharge	9	7	7

EJ Index for the Selected Area Compared to All People's Blockgroups in the State/Region/US



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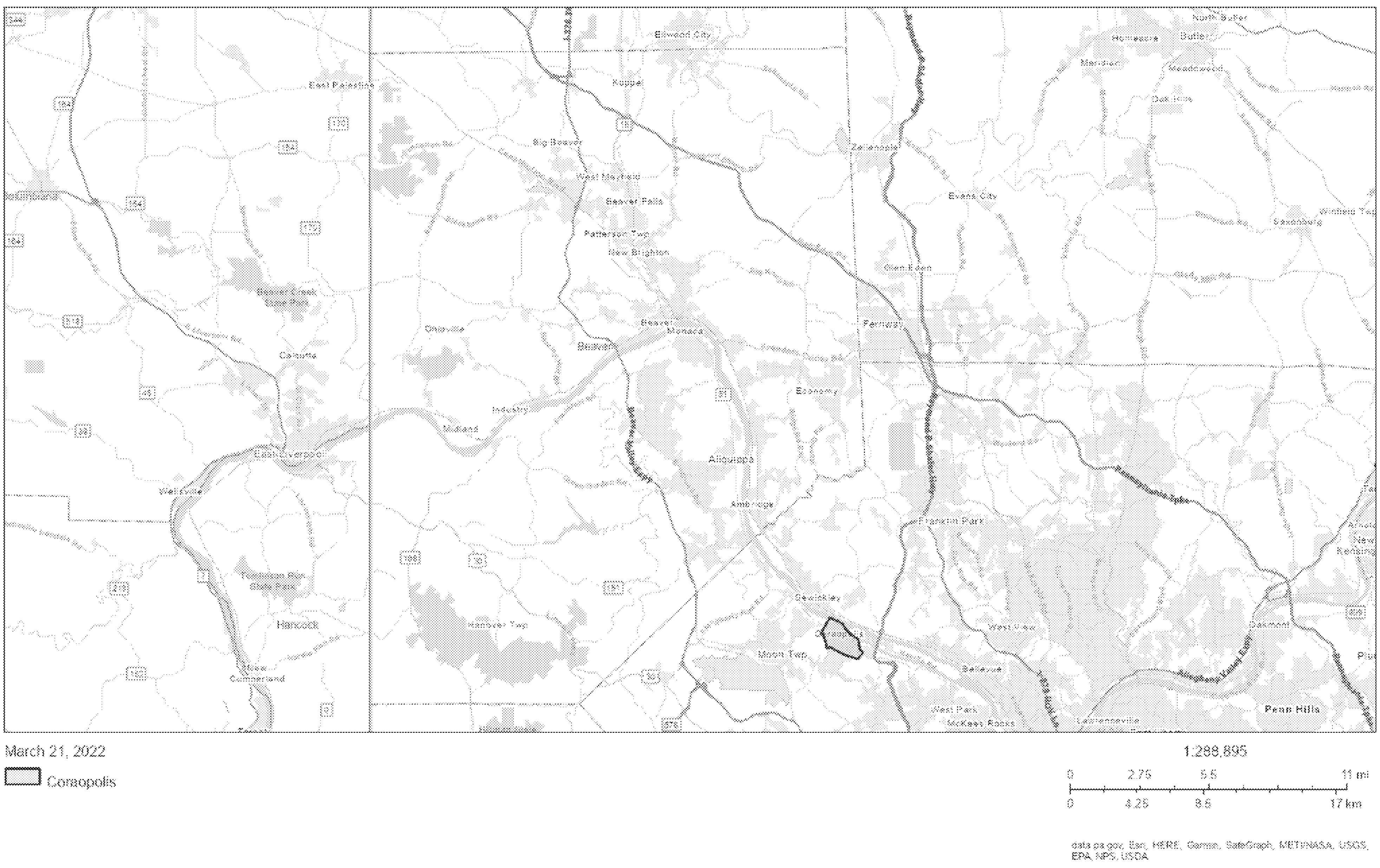

Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0

Selected Variables	Value	State		EPA Region		USA	
		Avg.	%tile	Avg.	%tile	Avg.	%tile
Pollution and Sources							
Particulate Matter 2.5 ($\mu g/m^3$)	9.46	8.72	88	8.2	95	8.74	73
Ozone (ppb)	45.4	42.1	99	41.9	93	42.6	78
2017 Diesel Particulate Matter* ($\mu g/m^3$)	0.246	0.269	47	0.267	<50th	0.295	50-60th
2017 Air Toxics Cancer Risk* (lifetime risk per million)	35	31	88	30	90-95th	29	90-95th
2017 Air Toxics Respiratory HI*	0.3	0.32	67	0.34	50-60th	0.36	<50th
Traffic Proximity (daily traffic count/distance to road)	500	580	68	680	65	710	68
Lead Paint (% Pre-1960 Housing)	0.77	0.47	80	0.35	88	0.28	92
Superfund Proximity (site count/km distance)	1.5	0.19	98	0.15	99	0.13	99
RMP Facility Proximity (facility count/km distance)	0.18	0.81	27	0.63	39	0.75	33
Hazardous Waste Proximity (facility count/km distance)	1.5	1.4	70	1.9	68	2.2	64
Underground Storage Tanks (count/km²)	4.2	3.4	75	2.7	80	3.9	74
Wastewater Discharge (toxicity-weighted concentration/m distance)	1	66	90	33	92	12	93
Socioeconomic Indicators							
Demographic Index	33%	26%	75	30%	65	36%	54
People of Color	26%	24%	71	33%	53	40%	44
Low Income	39%	28%	75	27%	76	31%	67
Unemployment Rate	8%	5%	78	5%	78	5%	76
Linguistically Isolated	2%	2%	71	3%	68	5%	56
Less Than High School Education	6%	9%	42	10%	41	12%	37
Under Age 5	5%	6%	52	6%	49	6%	45
Over Age 64	19%	18%	60	16%	66	16%	71

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's 2017 Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

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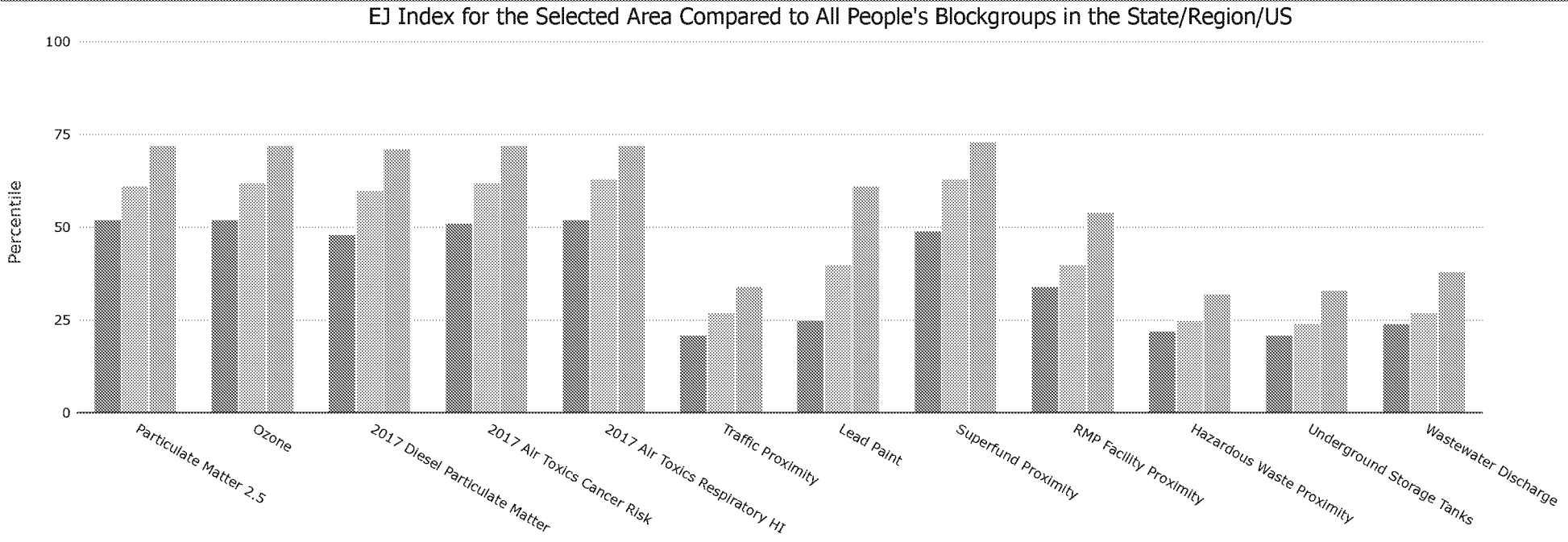
EJScreen Report (Version 2.0)

City: East Rochester borough
PENNSYLVANIA, EPA Region 3
Approximate Population: 472
Input Area (sq. miles): 0.46

Selected Variables	Percentile in State	Percentile in EPA Region	Percentile in USA
Environmental Justice Indexes			
EJ Index for Particulate Matter 2.5	72	61	52
EJ Index for Ozone	72	62	52
EJ Index for 2017 Diesel Particulate Matter*	71	60	48
EJ Index for 2017 Air Toxics Cancer Risk*	72	62	51
EJ Index for 2017 Air Toxics Respiratory HI*	72	63	52
EJ Index for Traffic Proximity	34	27	21
EJ Index for Lead Paint	61	40	25
EJ Index for Superfund Proximity	73	63	49
EJ Index for RMP Facility Proximity	54	40	34
EJ Index for Hazardous Waste Proximity	32	25	22
EJ Index for Underground Storage Tanks	33	24	21
EJ Index for Wastewater Discharge	38	27	24

EJ Index for the Selected Area Compared to All People's Blockgroups in the State/Region/US



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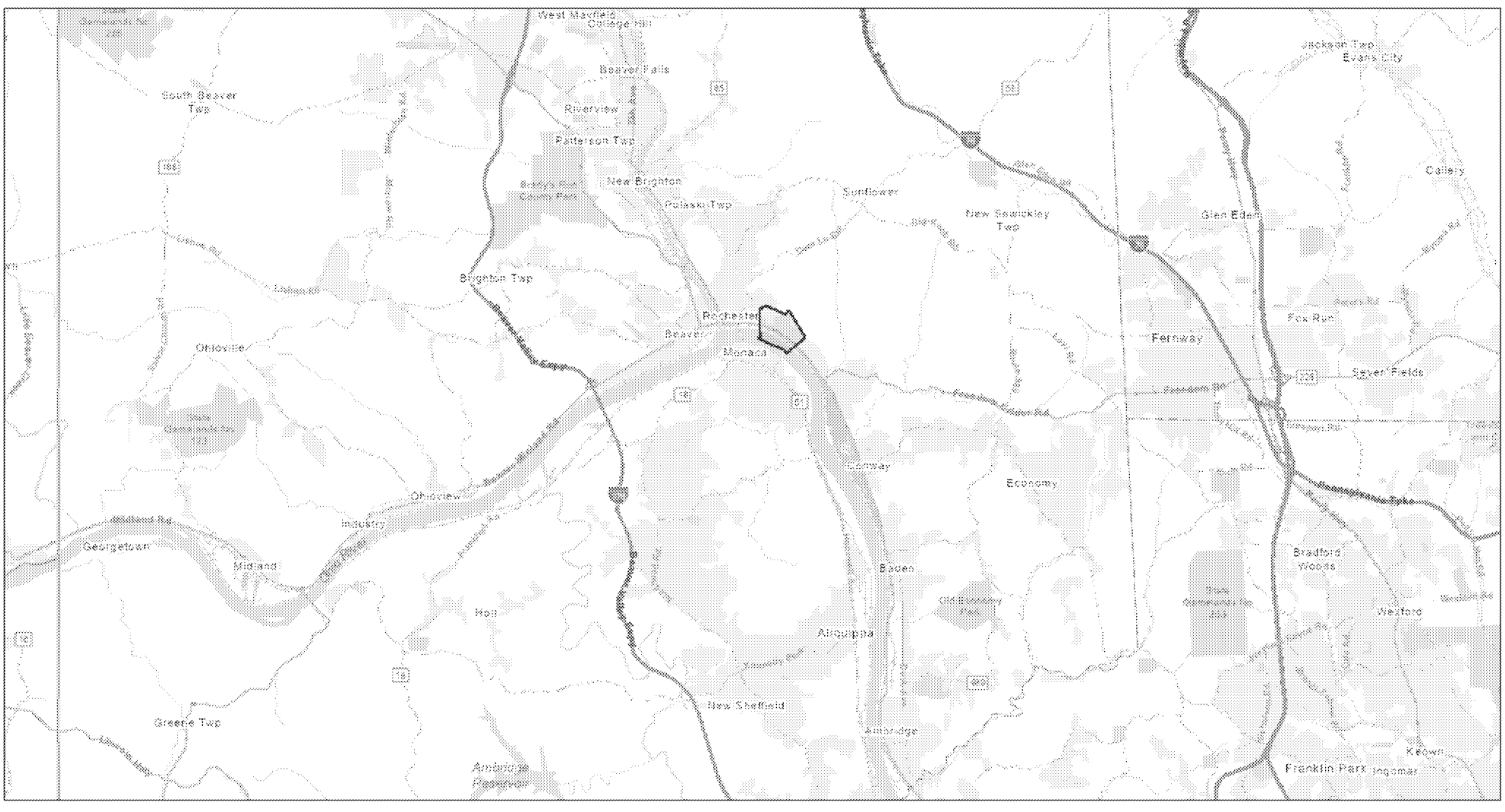

March 21, 2022

Project 1

1:144,448

0 1.25 2.5 5 mi
0 2.25 4.5 9 km

data sa gov, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA

Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0

Selected Variables	Value	State		EPA Region		USA	
		Avg.	%tile	Avg.	%tile	Avg.	%tile
Pollution and Sources							
Particulate Matter 2.5 ($\mu g/m^3$)	9.24	8.72	77	8.2	90	8.74	68
Ozone (ppb)	45	42.1	95	41.9	90	42.6	75
2017 Diesel Particulate Matter* ($\mu g/m^3$)	0.223	0.269	39	0.267	<50th	0.295	<50th
2017 Air Toxics Cancer Risk* (lifetime risk per million)	30	31	84	30	80-90th	29	80-90th
2017 Air Toxics Respiratory HI*	0.3	0.32	67	0.34	50-60th	0.36	<50th
Traffic Proximity (daily traffic count/distance to road)	990	580	85	680	81	710	82
Lead Paint (% Pre-1960 Housing)	0.7	0.47	72	0.35	82	0.28	88
Superfund Proximity (site count/km distance)	0.045	0.19	20	0.15	25	0.13	38
RMP Facility Proximity (facility count/km distance)	0.73	0.81	64	0.63	73	0.75	68
Hazardous Waste Proximity (facility count/km distance)	2.9	1.4	86	1.9	81	2.2	78
Underground Storage Tanks (count/km^2)	4.9	3.4	78	2.7	83	3.9	77
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.0071	66	61	33	72	12	66
Socioeconomic Indicators							
Demographic Index	22%	26%	60	30%	47	36%	36
People of Color	11%	24%	46	33%	30	40%	21
Low Income	34%	28%	68	27%	70	31%	61
Unemployment Rate	6%	5%	64	5%	64	5%	62
Linguistically Isolated	0%	2%	58	3%	55	5%	45
Less Than High School Education	8%	9%	52	10%	50	12%	45
Under Age 5	3%	6%	28	6%	26	6%	24
Over Age 64	39%	18%	97	16%	97	16%	97

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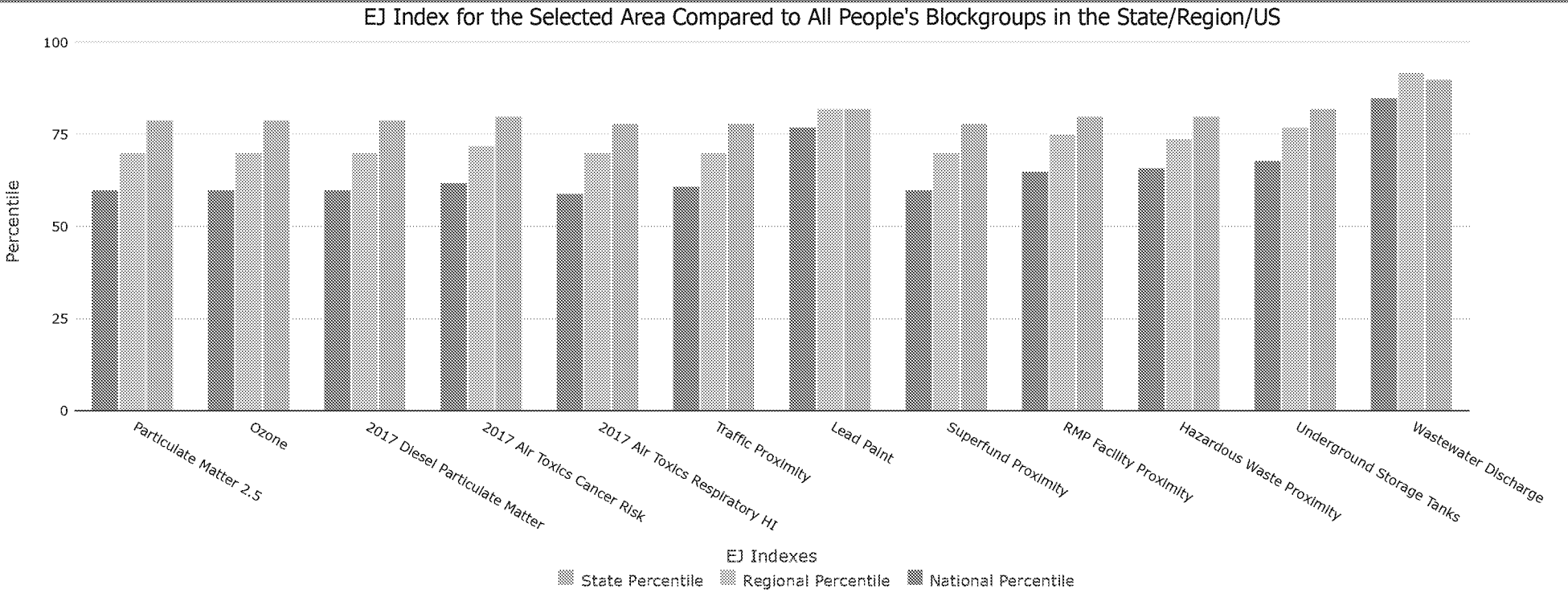
EJScreen Report (Version 2.0)

City: Beaver Falls
PENNSYLVANIA, EPA Region 3
Approximate Population: 8,464
Input Area (sq. miles): 2.35

Beaver Falls, PA

Selected Variables	Percentile in State	Percentile in EPA Region	Percentile in USA
Environmental Justice Indexes			
EJ Index for Particulate Matter 2.5	79	70	60
EJ Index for Ozone	79	70	60
EJ Index for 2017 Diesel Particulate Matter*	79	70	60
EJ Index for 2017 Air Toxics Cancer Risk*	80	72	62
EJ Index for 2017 Air Toxics Respiratory HI*	78	70	59
EJ Index for Traffic Proximity	78	70	61
EJ Index for Lead Paint	82	82	77
EJ Index for Superfund Proximity	78	70	60
EJ Index for RMP Facility Proximity	80	75	65
EJ Index for Hazardous Waste Proximity	80	74	66
EJ Index for Underground Storage Tanks	82	77	68
EJ Index for Wastewater Discharge	90	92	85

EJ Index for the Selected Area Compared to All People's Blockgroups in the State/Region/US



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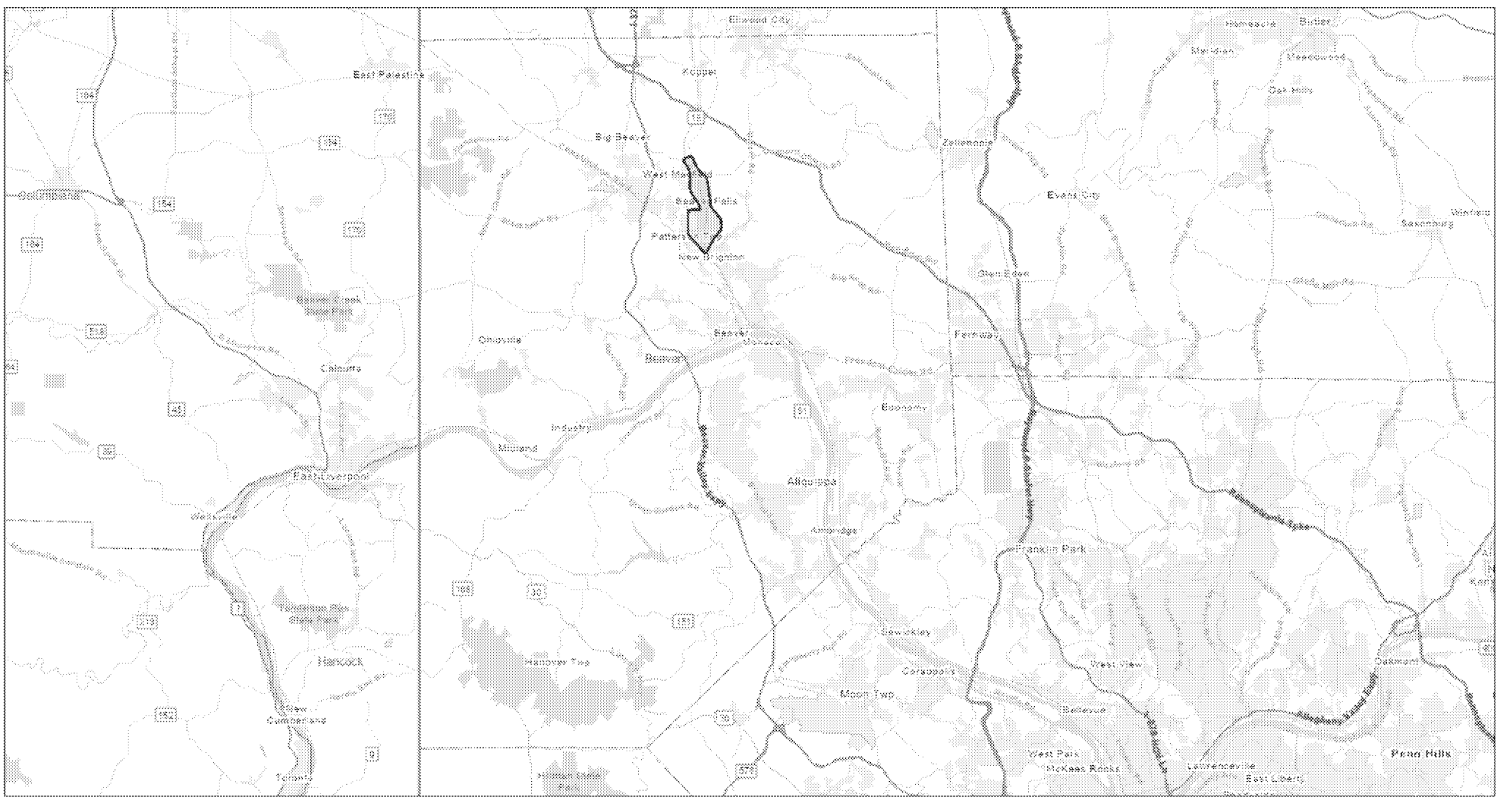

March 21, 2022
Beaver Falls, PA

1:288,895
0 2.75 5.5 11 mi
0 4.25 8.5 17 km

data.pa.gov, Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, EPA, NPS, USDA

Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	1

Selected Variables	Value	State		EPA Region		USA	
		Avg.	%tile	Avg.	%tile	Avg.	%tile
Pollution and Sources							
Particulate Matter 2.5 ($\mu g/m^3$)	9.16	8.72	70	8.2	87	8.74	65
Ozone (ppb)	44.7	42.1	91	41.9	88	42.6	73
2017 Diesel Particulate Matter* ($\mu g/m^3$)	0.193	0.269	29	0.267	<50th	0.295	<50th
2017 Air Toxics Cancer Risk* (lifetime risk per million)	27	31	65	30	60-70th	29	60-70th
2017 Air Toxics Respiratory HI*	0.3	0.32	67	0.34	50-60th	0.36	<50th
Traffic Proximity (daily traffic count/distance to road)	390	580	62	680	60	710	63
Lead Paint (% Pre-1960 Housing)	0.74	0.47	76	0.35	85	0.28	90
Superfund Proximity (site count/km distance)	0.033	0.19	11	0.15	14	0.13	29
RMP Facility Proximity (facility count/km distance)	0.46	0.81	52	0.63	63	0.75	58
Hazardous Waste Proximity (facility count/km distance)	1.5	1.4	71	1.9	68	2.2	64
Underground Storage Tanks (count/km^2)	1.8	3.4	57	2.7	62	3.9	56
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.11	66	84	33	87	12	85
Socioeconomic Indicators							
Demographic Index	41%	26%	81	30%	74	36%	64
People of Color	29%	24%	73	33%	56	40%	47
Low Income	55%	28%	88	27%	90	31%	85
Unemployment Rate	9%	5%	82	5%	82	5%	81
Linguistically Isolated	1%	2%	61	3%	58	5%	47
Less Than High School Education	14%	9%	77	10%	74	12%	67
Under Age 5	6%	6%	60	6%	56	6%	53
Over Age 64	16%	18%	41	16%	49	16%	56

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's 2017 Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

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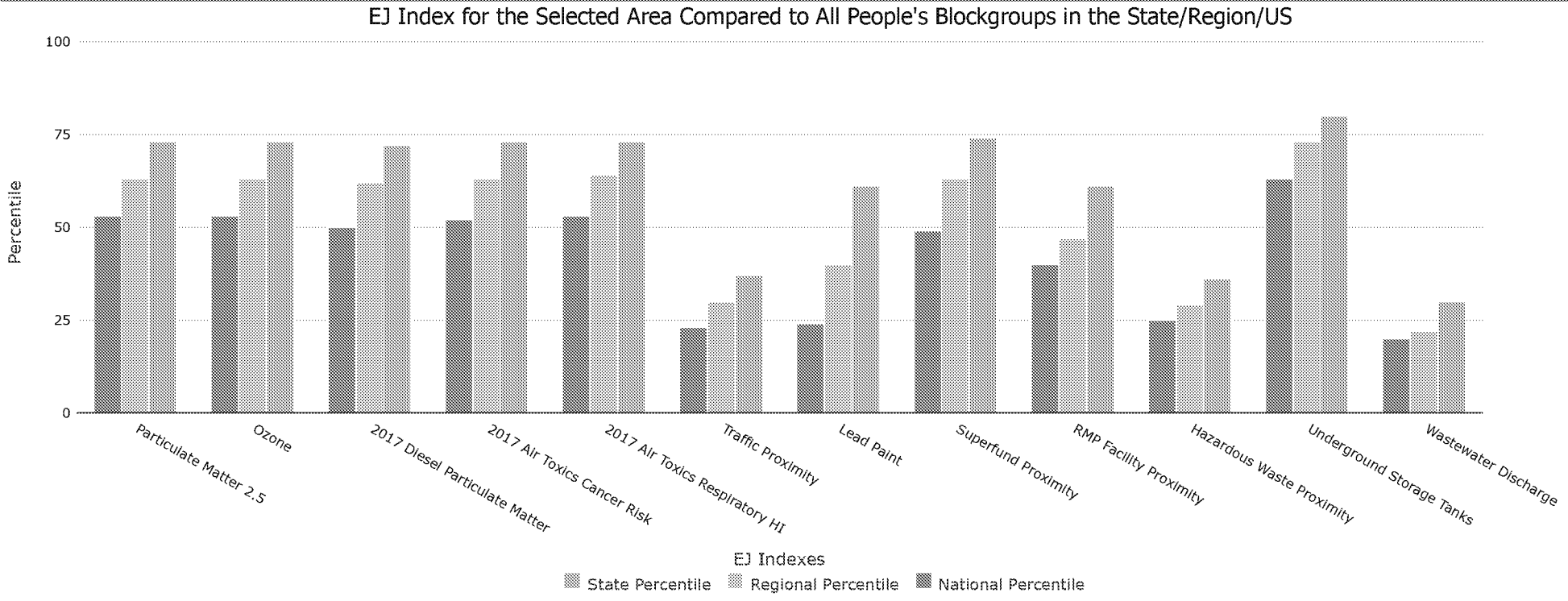
Save as PDF

EJScreen Report (Version 2.0)

City: Freedom borough
PENNSYLVANIA, EPA Region 3
Approximate Population: 1,532
Input Area (sq. miles): 0.74

Selected Variables	Percentile in State	Percentile in EPA Region	Percentile in USA
Environmental Justice Indexes			
EJ Index for Particulate Matter 2.5	73	63	53
EJ Index for Ozone	73	63	53
EJ Index for 2017 Diesel Particulate Matter*	72	62	50
EJ Index for 2017 Air Toxics Cancer Risk*	73	63	52
EJ Index for 2017 Air Toxics Respiratory HI*	73	64	53
EJ Index for Traffic Proximity	37	30	23
EJ Index for Lead Paint	61	40	24
EJ Index for Superfund Proximity	74	63	49
EJ Index for RMP Facility Proximity	61	47	40
EJ Index for Hazardous Waste Proximity	36	29	25
EJ Index for Underground Storage Tanks	80	73	63
EJ Index for Wastewater Discharge	30	22	20

EJ Index for the Selected Area Compared to All People's Blockgroups in the State/Region/US



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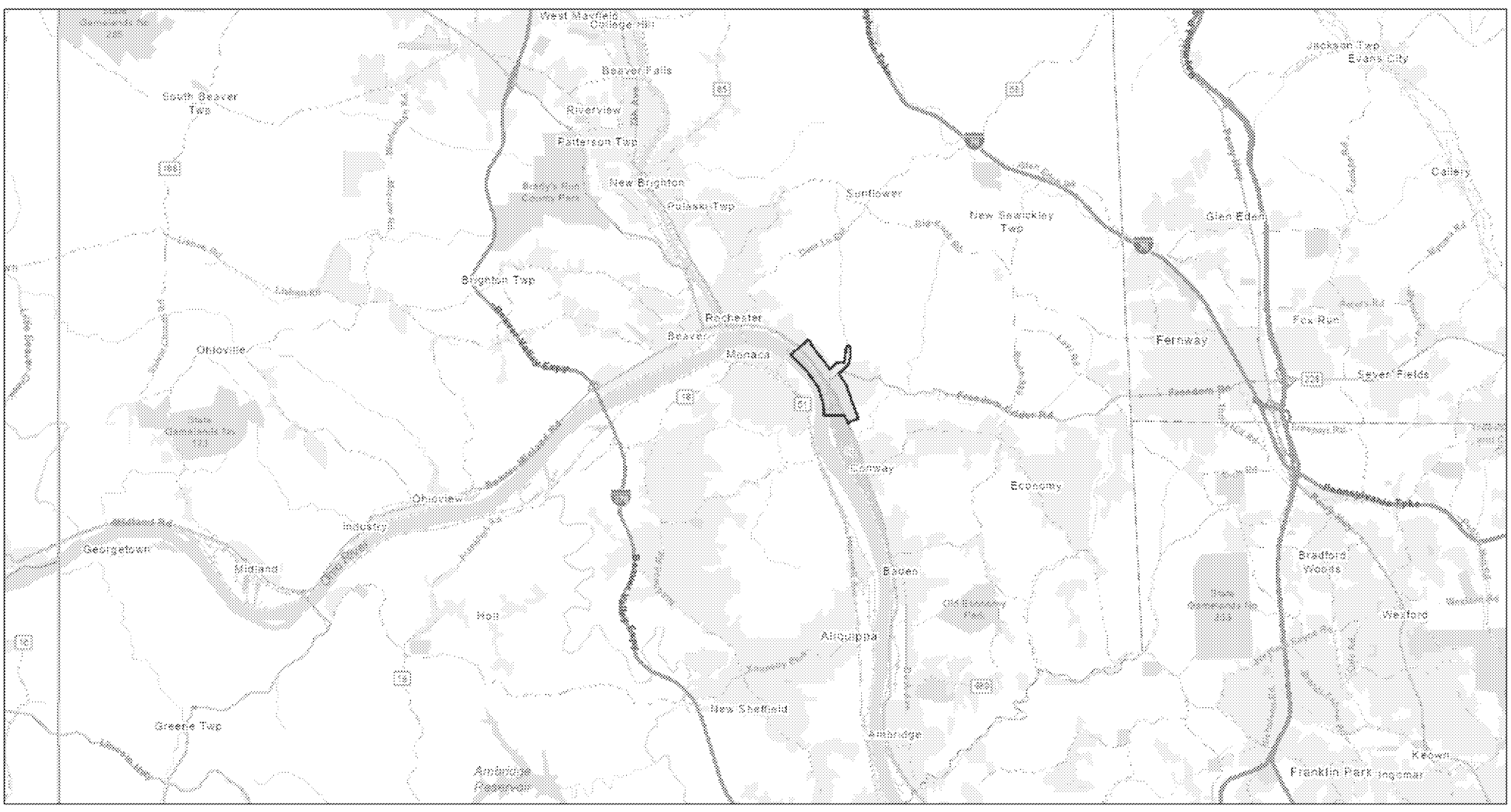

March 21, 2022

Project 1

1:144,448

0 1.25 2.5 5 mi
0 2.25 4.5 9 km

data sa.gov, Esri, HERE, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA

Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	1

Selected Variables	Value	State		EPA Region		USA	
		Avg.	%tile	Avg.	%tile	Avg.	%tile
Pollution and Sources							
Particulate Matter 2.5 ($\mu g/m^3$)	9.28	8.72	80	8.2	91	8.74	69
Ozone (ppb)	45.1	42.1	96	41.9	91	42.6	76
2017 Diesel Particulate Matter* ($\mu g/m^3$)	0.218	0.269	38	0.267	<50th	0.295	<50th
2017 Air Toxics Cancer Risk* (lifetime risk per million)	30	31	84	30	80-90th	29	80-90th
2017 Air Toxics Respiratory HI*	0.3	0.32	67	0.34	50-60th	0.36	<50th
Traffic Proximity (daily traffic count/distance to road)	960	580	84	680	80	710	82
Lead Paint (% Pre-1960 Housing)	0.83	0.47	86	0.35	91	0.28	94
Superfund Proximity (site count/km distance)	0.049	0.19	23	0.15	29	0.13	41
RMP Facility Proximity (facility count/km distance)	0.62	0.81	60	0.63	69	0.75	64
Hazardous Waste Proximity (facility count/km distance)	3.1	1.4	87	1.9	82	2.2	79
Underground Storage Tanks (count/km^2)	0	3.4	17	2.7	17	3.9	16
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.024	66	74	33	80	12	75
Socioeconomic Indicators							
Demographic Index	29%	26%	71	30%	59	36%	47
People of Color	10%	24%	43	33%	28	40%	19
Low Income	48%	28%	83	27%	85	31%	78
Unemployment Rate	8%	5%	76	5%	76	5%	74
Linguistically Isolated	0%	2%	58	3%	55	5%	45
Less Than High School Education	8%	9%	55	10%	52	12%	47
Under Age 5	7%	6%	72	6%	68	6%	64
Over Age 64	14%	18%	31	16%	40	16%	46

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's 2017 Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

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Save as PDF

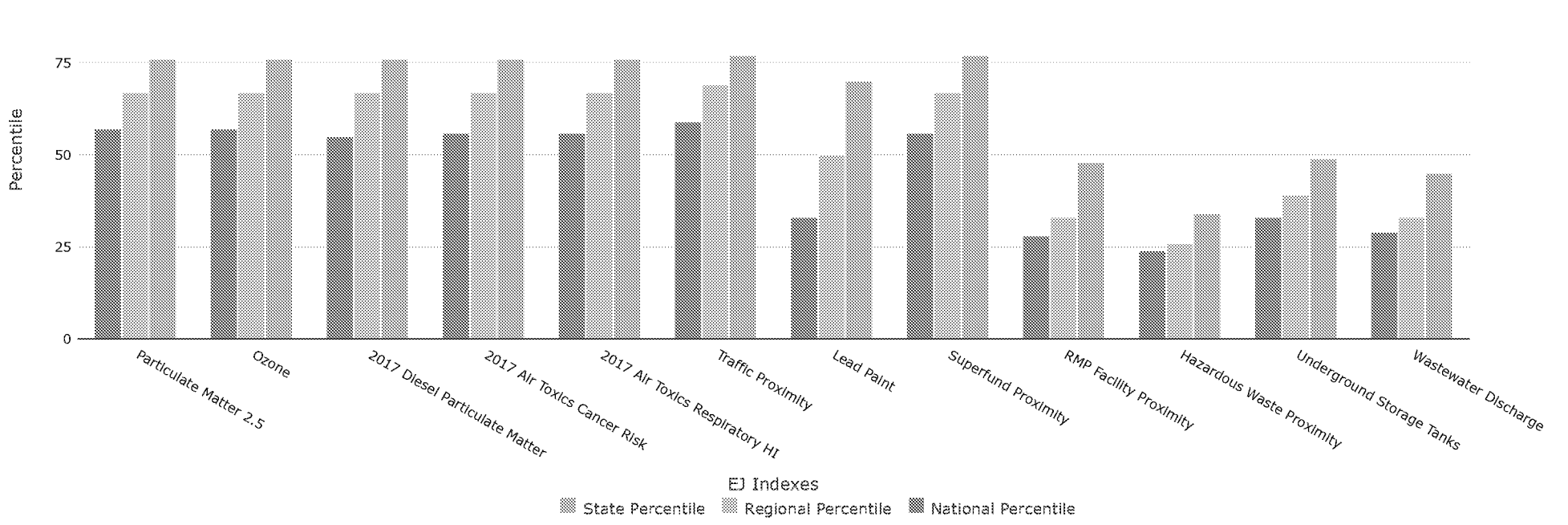
EJScreen Report (Version 2.0)

City: Midland borough
PENNSYLVANIA, EPA Region 3
Approximate Population: 2,918
Input Area (sq. miles): 1.99

Midland

Selected Variables	Percentile in State	Percentile in EPA Region	Percentile in USA
Environmental Justice Indexes			
EJ Index for Particulate Matter 2.5	76	67	57
EJ Index for Ozone	76	67	57
EJ Index for 2017 Diesel Particulate Matter*	76	67	55
EJ Index for 2017 Air Toxics Cancer Risk*	76	67	56
EJ Index for 2017 Air Toxics Respiratory HI*	76	67	56
EJ Index for Traffic Proximity	77	69	59
EJ Index for Lead Paint	70	50	33
EJ Index for Superfund Proximity	77	67	56
EJ Index for RMP Facility Proximity	48	33	28
EJ Index for Hazardous Waste Proximity	34	26	24
EJ Index for Underground Storage Tanks	49	39	33
EJ Index for Wastewater Discharge	45	33	29

EJ Index for the Selected Area Compared to All People's Blockgroups in the State/Region/US



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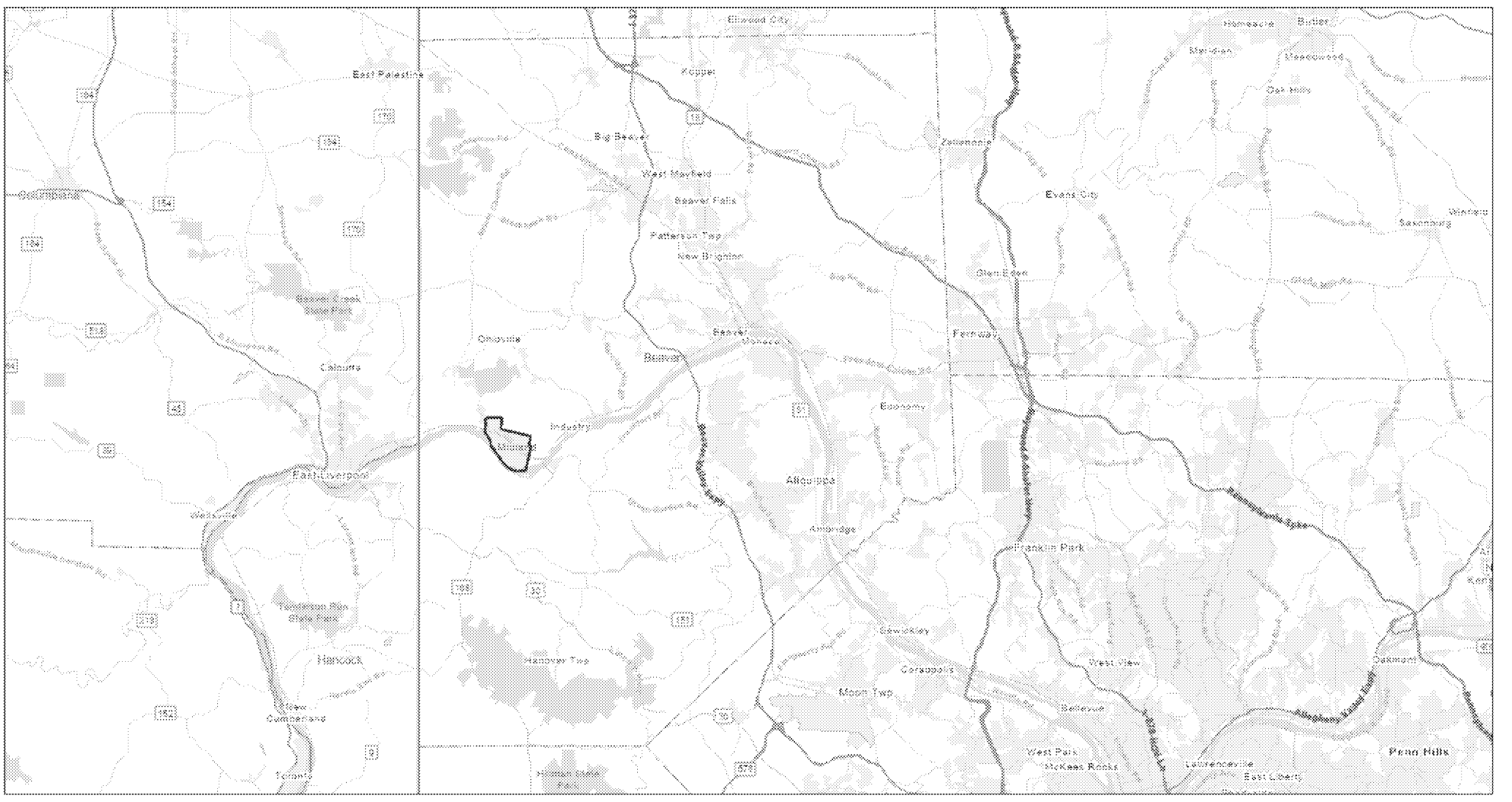

Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	1

Selected Variables	Value	State		EPA Region		USA	
		Avg.	%tile	Avg.	%tile	Avg.	%tile
Pollution and Sources							
Particulate Matter 2.5 (µg/m³)	8.78	8.72	40	8.2	75	8.74	55
Ozone (ppb)	45.1	42.1	96	41.9	91	42.6	76
2017 Diesel Particulate Matter* (µg/m³)	0.201	0.269	31	0.267	<50th	0.295	<50th
2017 Air Toxics Cancer Risk* (lifetime risk per million)	30	31	84	30	80-90th	29	80-90th
2017 Air Toxics Respiratory HI*	0.3	0.32	67	0.34	50-60th	0.36	<50th
Traffic Proximity (daily traffic count/distance to road)	240	580	48	680	48	710	51
Lead Paint (% Pre-1960 Housing)	0.84	0.47	87	0.35	92	0.28	95
Superfund Proximity (site count/km distance)	0.034	0.19	12	0.15	16	0.13	30
RMP Facility Proximity (facility count/km distance)	1.2	0.81	78	0.63	84	0.75	80
Hazardous Waste Proximity (facility count/km distance)	1.6	1.4	72	1.9	69	2.2	66
Underground Storage Tanks (count/km²)	3.7	3.4	73	2.7	78	3.9	72
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.0092	66	64	33	73	12	68
Socioeconomic Indicators							
Demographic Index	31%	26%	73	30%	62	36%	50
People of Color	18%	24%	61	33%	43	40%	33
Low Income	43%	28%	79	27%	80	31%	72
Unemployment Rate	15%	5%	93	5%	94	5%	93
Linguistically Isolated	0%	2%	58	3%	55	5%	45
Less Than High School Education	14%	9%	78	10%	75	12%	67
Under Age 5	6%	6%	60	6%	56	6%	52
Over Age 64	20%	18%	63	16%	68	16%	73

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's 2017 Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

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Save as PDF

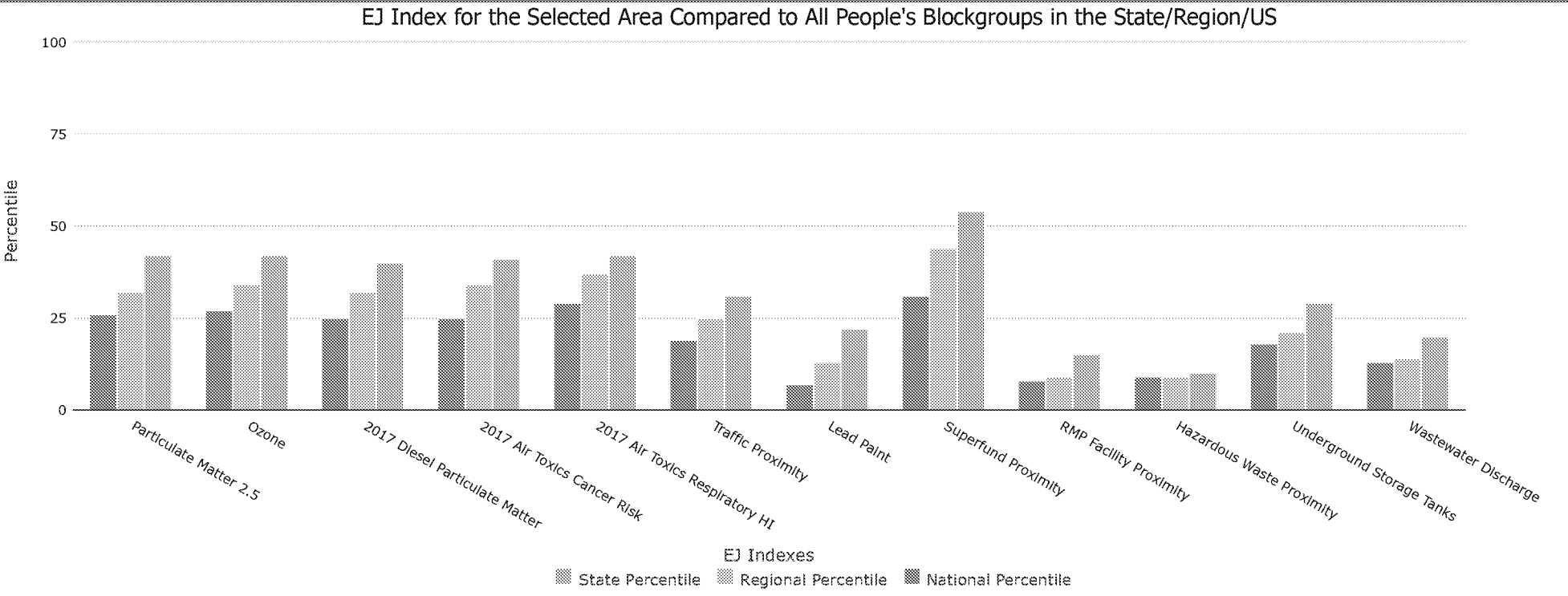
EJScreen Report (Version 2.0)

City: Monaca borough
PENNSYLVANIA, EPA Region 3
Approximate Population: 5,521
Input Area (sq. miles): 2.38

Monaca, PA

Selected Variables	Percentile in State	Percentile in EPA Region	Percentile in USA
Environmental Justice Indexes			
EJ Index for Particulate Matter 2.5	42	32	26
EJ Index for Ozone	42	34	27
EJ Index for 2017 Diesel Particulate Matter*	40	32	25
EJ Index for 2017 Air Toxics Cancer Risk*	41	34	25
EJ Index for 2017 Air Toxics Respiratory HI*	42	37	29
EJ Index for Traffic Proximity	31	25	19
EJ Index for Lead Paint	22	13	7
EJ Index for Superfund Proximity	54	44	31
EJ Index for RMP Facility Proximity	15	9	8
EJ Index for Hazardous Waste Proximity	10	9	9
EJ Index for Underground Storage Tanks	29	21	18
EJ Index for Wastewater Discharge	20	14	13

EJ Index for the Selected Area Compared to All People's Blockgroups in the State/Region/US



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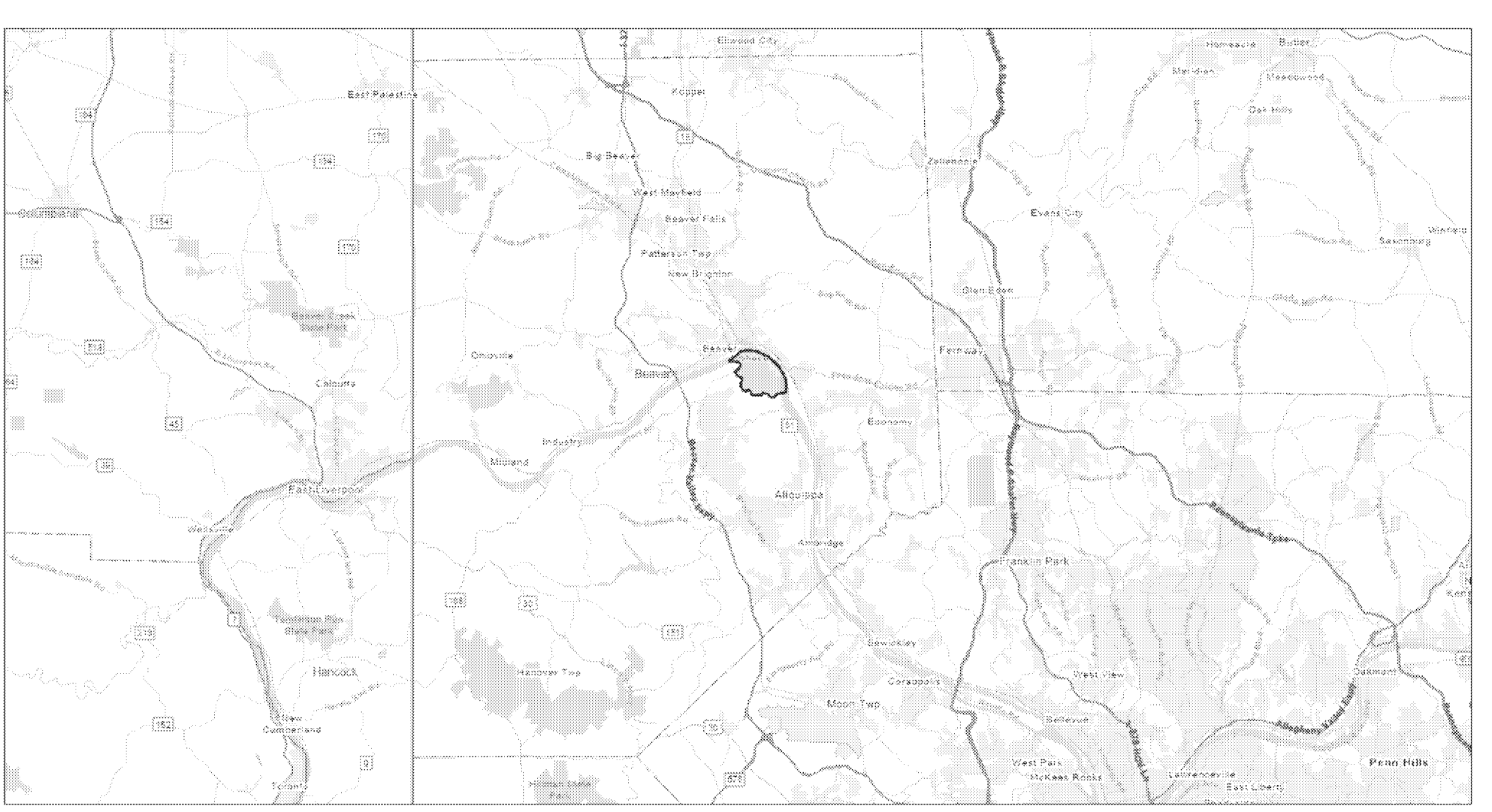

March 21, 2022

Monaca, PA

1:288,895

0 2.75 5.5 11 mi
0 4.25 8.5 17 km

data.pa.gov, Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, EPA, NPS, USDA

Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	1

Selected Variables	Value	State		EPA Region		USA	
		Avg.	%tile	Avg.	%tile	Avg.	%tile
Pollution and Sources							
Particulate Matter 2.5 ($\mu g/m^3$)	9.23	8.72	76	8.2	90	8.74	67
Ozone (ppb)	45.2	42.1	97	41.9	92	42.6	76
2017 Diesel Particulate Matter* ($\mu g/m^3$)	0.243	0.269	46	0.267	<50th	0.295	50-60th
2017 Air Toxics Cancer Risk* (lifetime risk per million)	30	31	84	30	80-90th	29	80-90th
2017 Air Toxics Respiratory HI*	0.33	0.32	77	0.34	60-70th	0.36	50-60th
Traffic Proximity (daily traffic count/distance to road)	400	580	63	680	61	710	63
Lead Paint (% Pre-1960 Housing)	0.6	0.47	64	0.35	77	0.28	83
Superfund Proximity (site count/km distance)	0.047	0.19	21	0.15	27	0.13	40
RMP Facility Proximity (facility count/km distance)	1.3	0.81	80	0.63	86	0.75	82
Hazardous Waste Proximity (facility count/km distance)	2.6	1.4	84	1.9	79	2.2	76
Underground Storage Tanks (count/km^2)	1.4	3.4	52	2.7	56	3.9	51
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.023	66	74	33	80	12	75
Socioeconomic Indicators							
Demographic Index	21%	26%	57	30%	44	36%	33
People of Color	10%	24%	45	33%	30	40%	21
Low Income	32%	28%	65	27%	67	31%	57
Unemployment Rate	5%	5%	59	5%	60	5%	58
Linguistically Isolated	0%	2%	58	3%	55	5%	45
Less Than High School Education	8%	9%	54	10%	52	12%	46
Under Age 5	4%	6%	41	6%	38	6%	35
Over Age 64	19%	18%	61	16%	67	16%	72

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Save as PDF

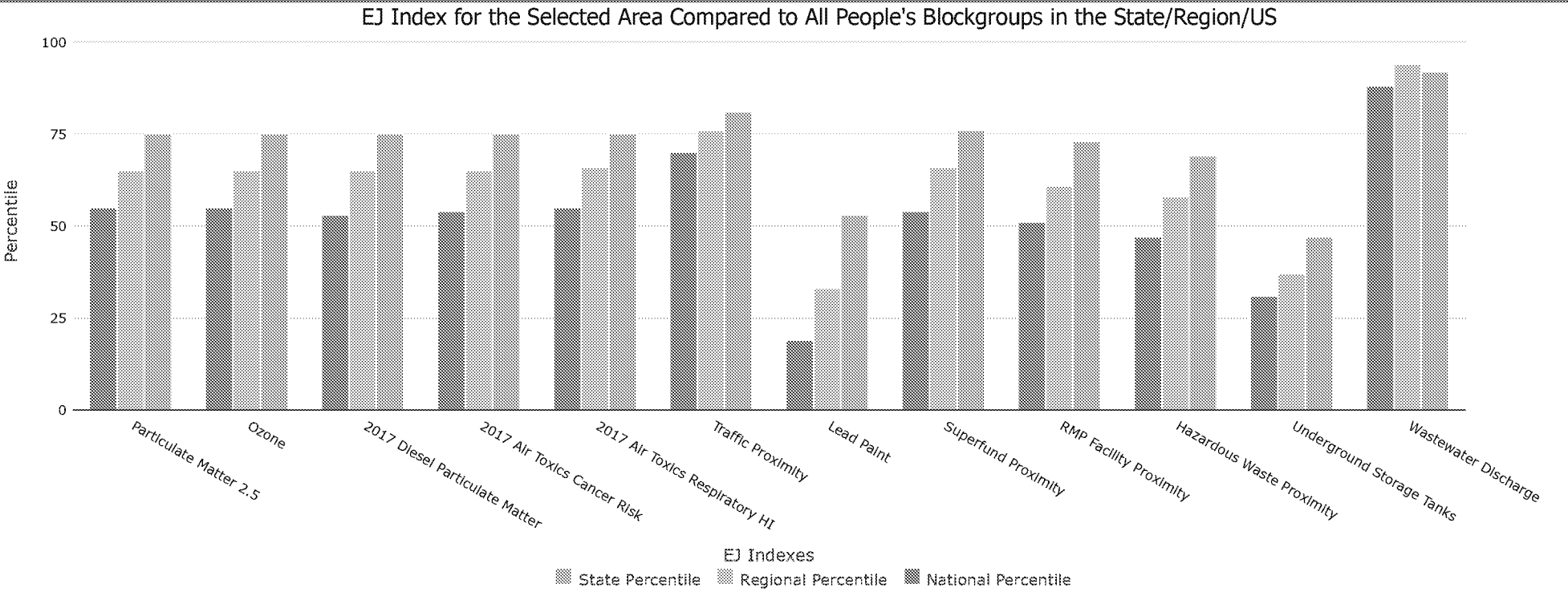
EJScreen Report (Version 2.0)

City: New Brighton borough
PENNSYLVANIA, EPA Region 3
Approximate Population: 5,761
Input Area (sq. miles): 1.12

New Brighton, PA

Selected Variables	Percentile in State	Percentile in EPA Region	Percentile in USA
Environmental Justice Indexes			
EJ Index for Particulate Matter 2.5	75	65	55
EJ Index for Ozone	75	65	55
EJ Index for 2017 Diesel Particulate Matter*	75	65	53
EJ Index for 2017 Air Toxics Cancer Risk*	75	65	54
EJ Index for 2017 Air Toxics Respiratory HI*	75	66	55
EJ Index for Traffic Proximity	81	76	70
EJ Index for Lead Paint	53	33	19
EJ Index for Superfund Proximity	76	66	54
EJ Index for RMP Facility Proximity	73	61	51
EJ Index for Hazardous Waste Proximity	69	58	47
EJ Index for Underground Storage Tanks	47	37	31
EJ Index for Wastewater Discharge	92	94	88

EJ Index for the Selected Area Compared to All People's Blockgroups in the State/Region/US



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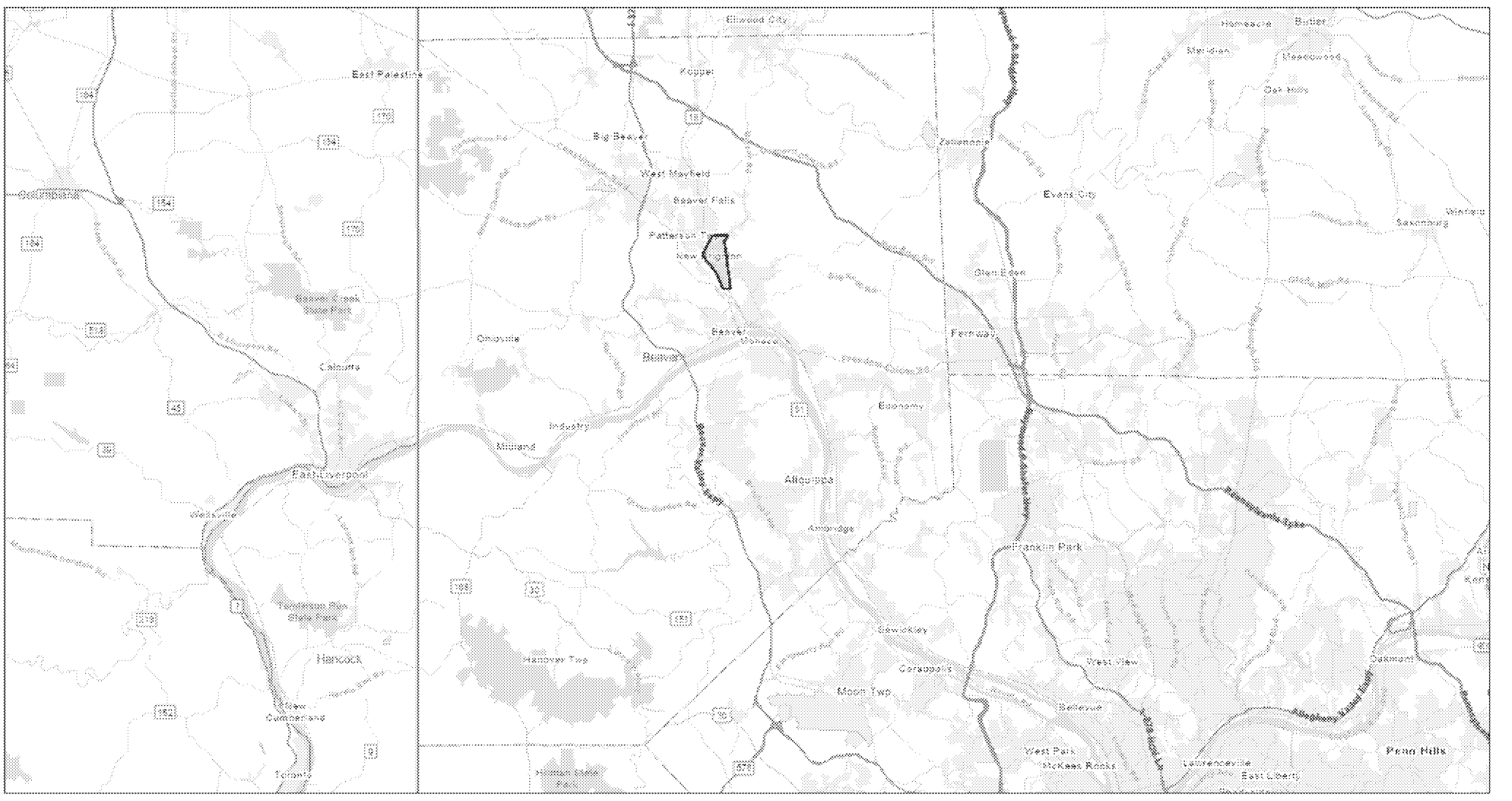

March 21, 2022
New Brighton, PA

1:288,895
0 2.75 5.5 11 mi
0 4.25 8.5 17 km

data.pa.gov, Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, EPA, NPS, USDA

Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0

Selected Variables	Value	State		EPA Region		USA	
		Avg.	%tile	Avg.	%tile	Avg.	%tile
Pollution and Sources							
Particulate Matter 2.5 ($\mu g/m^3$)	9.19	8.72	73	8.2	88	8.74	66
Ozone (ppb)	44.9	42.1	93	41.9	89	42.6	74
2017 Diesel Particulate Matter* ($\mu g/m^3$)	0.213	0.269	35	0.267	<50th	0.295	<50th
2017 Air Toxics Cancer Risk* (lifetime risk per million)	30	31	84	30	80-90th	29	80-90th
2017 Air Toxics Respiratory HI*	0.3	0.32	67	0.34	50-60th	0.36	<50th
Traffic Proximity (daily traffic count/distance to road)	500	580	68	680	66	710	68
Lead Paint (% Pre-1960 Housing)	0.82	0.47	86	0.35	91	0.28	94
Superfund Proximity (site count/km distance)	0.036	0.19	14	0.15	17	0.13	32
RMP Facility Proximity (facility count/km distance)	0.35	0.81	46	0.63	58	0.75	52
Hazardous Waste Proximity (facility count/km distance)	2.5	1.4	83	1.9	78	2.2	75
Underground Storage Tanks (count/km^2)	3.9	3.4	73	2.7	79	3.9	72
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.14	66	85	33	88	12	86
Socioeconomic Indicators							
Demographic Index	31%	26%	73	30%	62	36%	51
People of Color	16%	24%	57	33%	40	40%	30
Low Income	46%	28%	82	27%	84	31%	76
Unemployment Rate	8%	5%	76	5%	77	5%	75
Linguistically Isolated	0%	2%	58	3%	55	5%	45
Less Than High School Education	8%	9%	54	10%	52	12%	47
Under Age 5	8%	6%	79	6%	75	6%	72
Over Age 64	18%	18%	54	16%	61	16%	67

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's 2017 Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

For additional information, see: www.epa.gov/environmentaljustice

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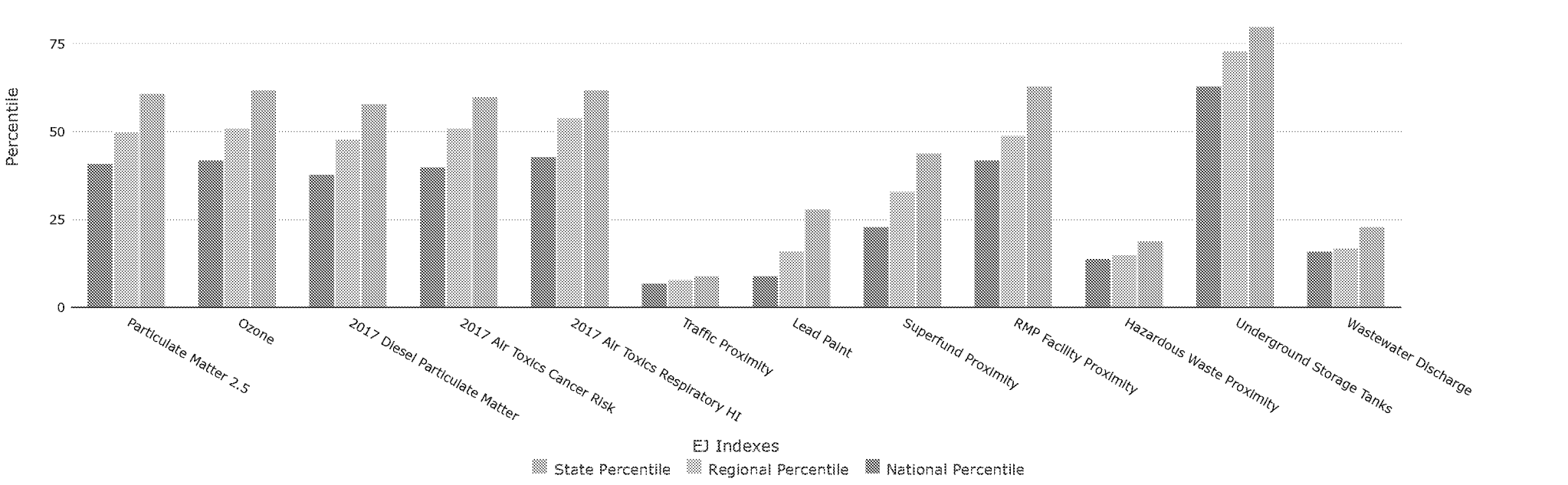
EJScreen Report (Version 2.0)

City: Leetsdale borough
PENNSYLVANIA, EPA Region 3
Approximate Population: 1,189
Input Area (sq. miles): 1.18

Leetsdale

Selected Variables	Percentile in State	Percentile in EPA Region	Percentile in USA
Environmental Justice Indexes			
EJ Index for Particulate Matter 2.5	61	50	41
EJ Index for Ozone	62	51	42
EJ Index for 2017 Diesel Particulate Matter*	58	48	38
EJ Index for 2017 Air Toxics Cancer Risk*	60	51	40
EJ Index for 2017 Air Toxics Respiratory HI*	62	54	43
EJ Index for Traffic Proximity	9	8	7
EJ Index for Lead Paint	28	16	9
EJ Index for Superfund Proximity	44	33	23
EJ Index for RMP Facility Proximity	63	49	42
EJ Index for Hazardous Waste Proximity	19	15	14
EJ Index for Underground Storage Tanks	80	73	63
EJ Index for Wastewater Discharge	23	17	16

EJ Index for the Selected Area Compared to All People's Blockgroups in the State/Region/US



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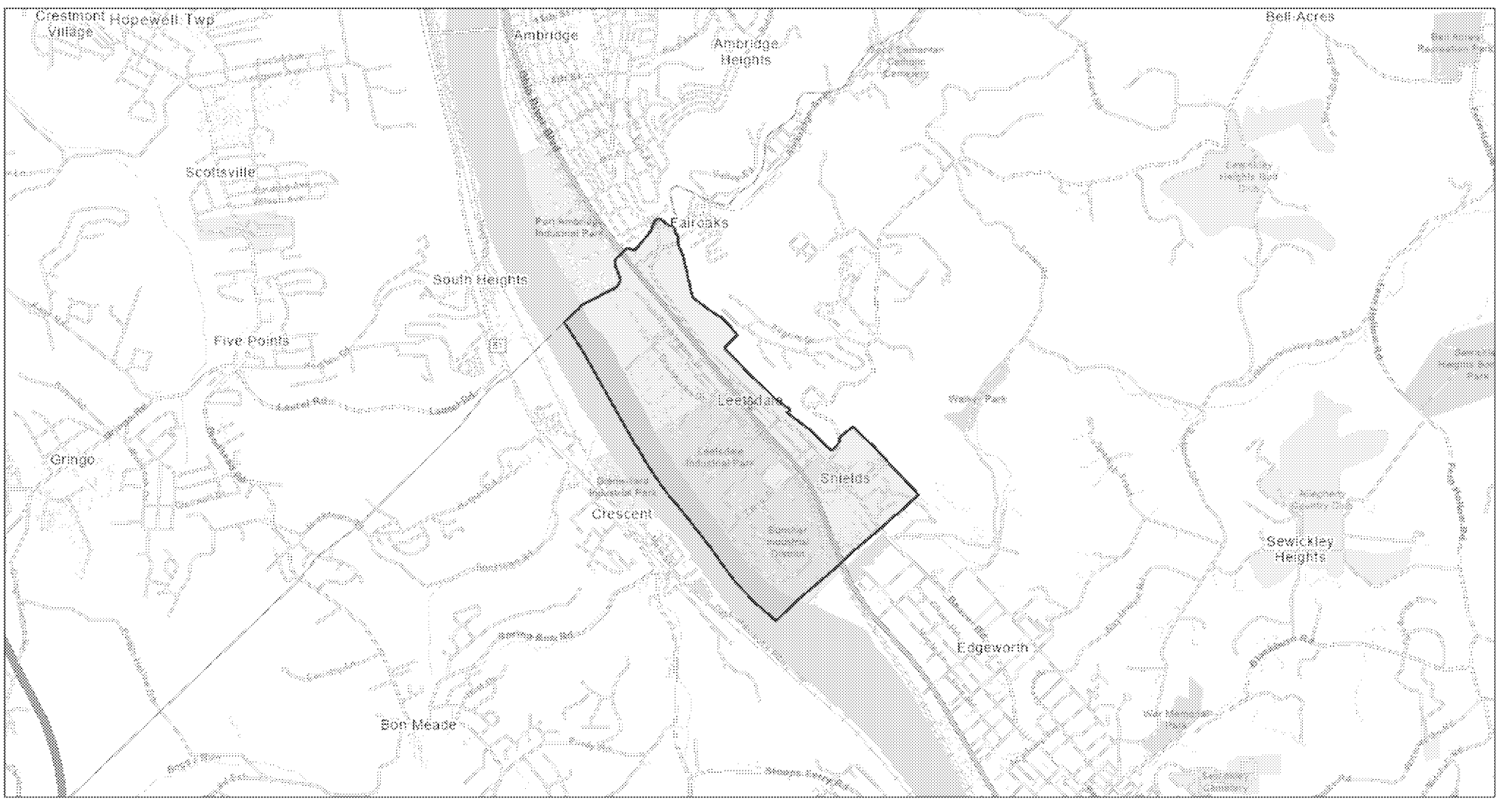

Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	1

Selected Variables	Value	State		EPA Region		USA	
		Avg.	%tile	Avg.	%tile	Avg.	%tile
Pollution and Sources							
Particulate Matter 2.5 ($\mu g/m^3$)	9.31	8.72	81	8.2	92	8.74	70
Ozone (ppb)	45.3	42.1	99	41.9	93	42.6	78
2017 Diesel Particulate Matter* ($\mu g/m^3$)	0.224	0.269	40	0.267	<50th	0.295	<50th
2017 Air Toxics Cancer Risk* (lifetime risk per million)	30	31	84	30	80-90th	29	80-90th
2017 Air Toxics Respiratory HI*	0.3	0.32	67	0.34	50-60th	0.36	<50th
Traffic Proximity (daily traffic count/distance to road)	1600	580	92	680	89	710	89
Lead Paint (% Pre-1960 Housing)	0.85	0.47	89	0.35	93	0.28	95
Superfund Proximity (site count/km distance)	0.14	0.19	64	0.15	71	0.13	77
RMP Facility Proximity (facility count/km distance)	0.2	0.81	30	0.63	43	0.75	37
Hazardous Waste Proximity (facility count/km distance)	2.6	1.4	84	1.9	79	2.2	76
Underground Storage Tanks (count/km^2)	0	3.4	17	2.7	17	3.9	16
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.019	66	71	33	78	12	74
Socioeconomic Indicators							
Demographic Index	24%	26%	64	30%	50	36%	39
People of Color	22%	24%	66	33%	48	40%	38
Low Income	27%	28%	55	27%	57	31%	48
Unemployment Rate	2%	5%	26	5%	26	5%	25
Linguistically Isolated	1%	2%	59	3%	56	5%	46
Less Than High School Education	12%	9%	70	10%	67	12%	60
Under Age 5	4%	6%	40	6%	38	6%	35
Over Age 64	23%	18%	75	16%	79	16%	82

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's 2017 Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

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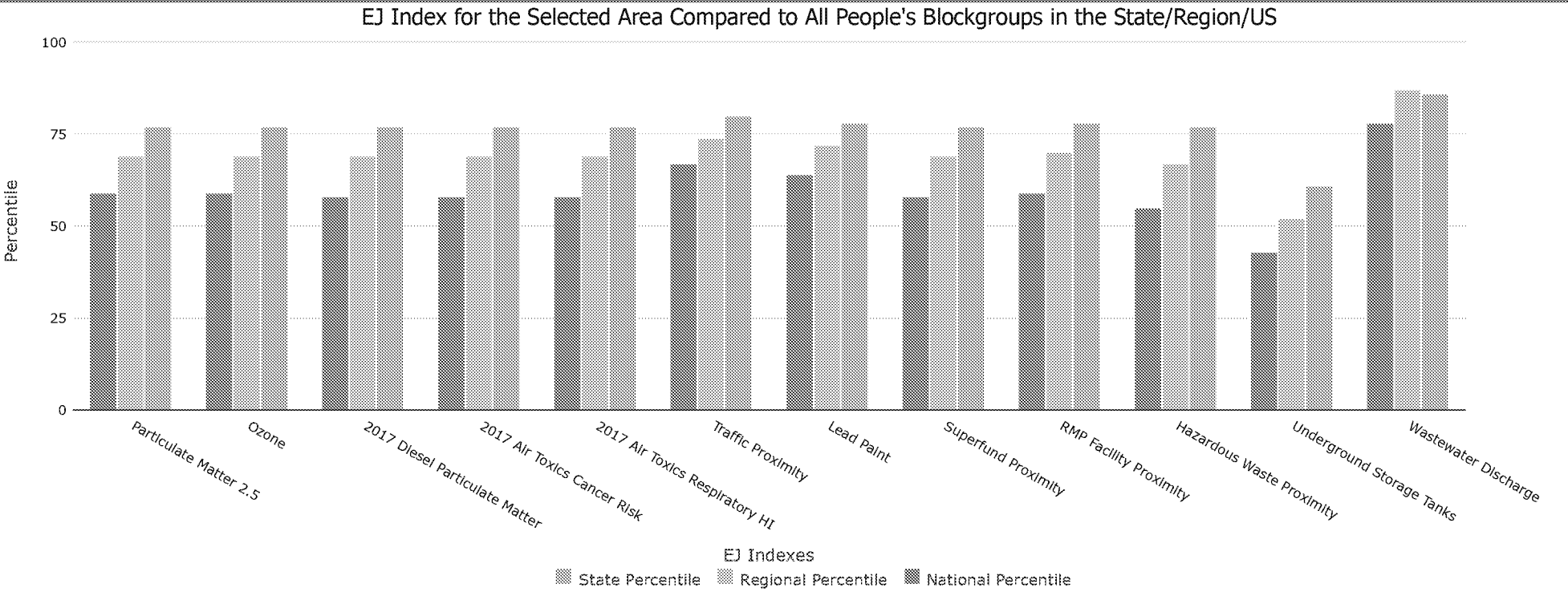
EJScreen Report (Version 2.0)

City: Rochester borough
PENNSYLVANIA, EPA Region 3
Approximate Population: 3,501
Input Area (sq. miles): 0.73

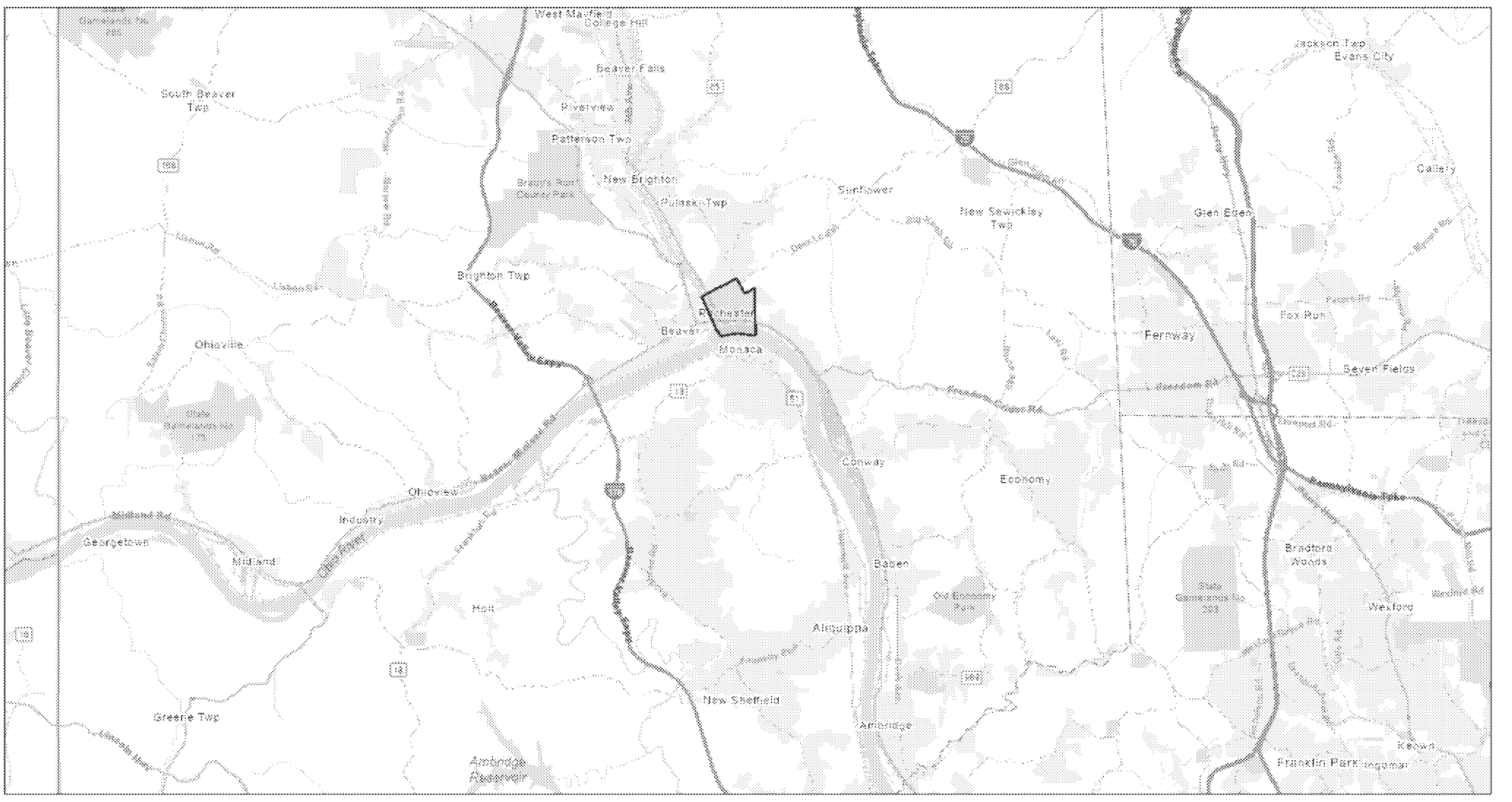
Rochester

Selected Variables	Percentile in State	Percentile in EPA Region	Percentile in USA
Environmental Justice Indexes			
EJ Index for Particulate Matter 2.5	77	69	59
EJ Index for Ozone	77	69	59
EJ Index for 2017 Diesel Particulate Matter*	77	69	58
EJ Index for 2017 Air Toxics Cancer Risk*	77	69	58
EJ Index for 2017 Air Toxics Respiratory HI*	77	69	58
EJ Index for Traffic Proximity	80	74	67
EJ Index for Lead Paint	78	72	64
EJ Index for Superfund Proximity	77	69	58
EJ Index for RMP Facility Proximity	78	70	59
EJ Index for Hazardous Waste Proximity	77	67	55
EJ Index for Underground Storage Tanks	61	52	43
EJ Index for Wastewater Discharge	86	87	78

EJ Index for the Selected Area Compared to All People's Blockgroups in the State/Region/US



This report shows the values for environmental and demographic indicators and EJScreen indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJScreen documentation for discussion of these issues before using reports.



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0

Selected Variables	Value	State		EPA Region		USA	
		Avg.	%tile	Avg.	%tile	Avg.	%tile
Pollution and Sources							
Particulate Matter 2.5 ($\mu g/m^3$)	9.22	8.72	76	8.2	90	8.74	67
Ozone (ppb)	45.1	42.1	95	41.9	91	42.6	76
2017 Diesel Particulate Matter* ($\mu g/m^3$)	0.259	0.269	50	0.267	50-60th	0.295	50-60th
2017 Air Toxics Cancer Risk* (lifetime risk per million)	30	31	84	30	80-90th	29	80-90th
2017 Air Toxics Respiratory HI*	0.3	0.32	67	0.34	50-60th	0.36	<50th
Traffic Proximity (daily traffic count/distance to road)	930	580	84	680	80	710	81
Lead Paint (% Pre-1960 Housing)	0.74	0.47	77	0.35	86	0.28	90
Superfund Proximity (site count/km distance)	0.043	0.19	18	0.15	23	0.13	37
RMP Facility Proximity (facility count/km distance)	0.47	0.81	52	0.63	63	0.75	58
Hazardous Waste Proximity (facility count/km distance)	2.8	1.4	85	1.9	80	2.2	77
Underground Storage Tanks (count/km^2)	7.3	3.4	85	2.7	90	3.9	84
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.047	66	79	33	84	12	80
Socioeconomic Indicators							
Demographic Index	37%	26%	78	30%	70	36%	59
People of Color	26%	24%	70	33%	53	40%	43
Low Income	48%	28%	83	27%	85	31%	78
Unemployment Rate	8%	5%	77	5%	77	5%	75
Linguistically Isolated	1%	2%	60	3%	57	5%	46
Less Than High School Education	11%	9%	68	10%	65	12%	58
Under Age 5	5%	6%	45	6%	42	6%	39
Over Age 64	11%	18%	22	16%	30	16%	35

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's 2017 Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

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Save as PDF

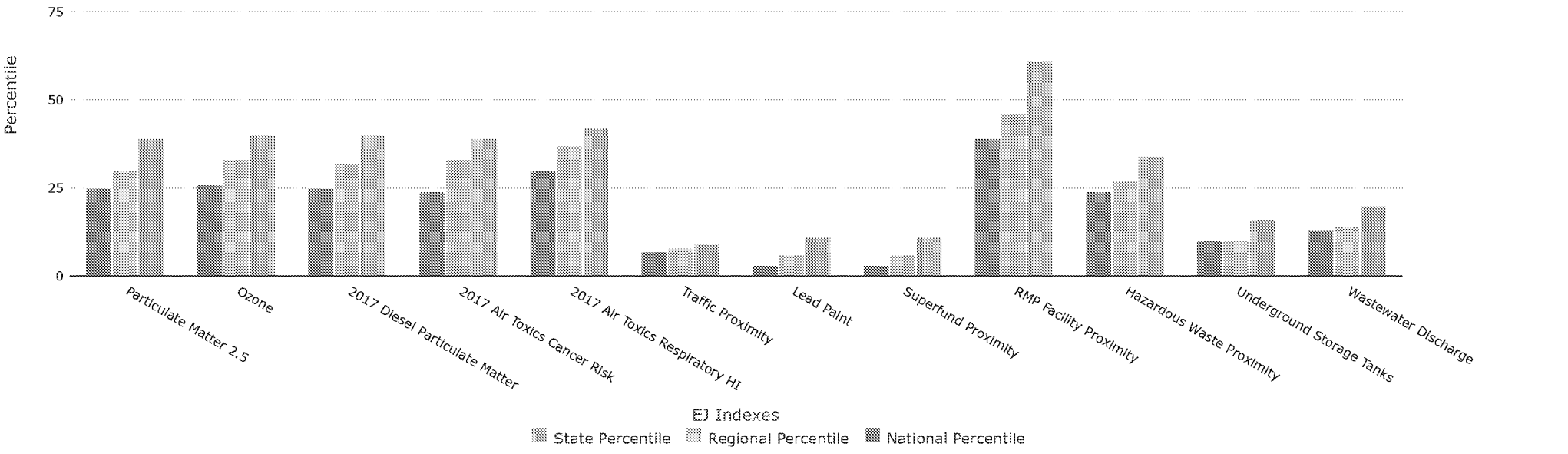
EJScreen Report (Version 2.0)

City: Sewickley borough
PENNSYLVANIA, EPA Region 3
Approximate Population: 3,829
Input Area (sq. miles): 1.14

Sewickley

Selected Variables	Percentile in State	Percentile in EPA Region	Percentile in USA
Environmental Justice Indexes			
EJ Index for Particulate Matter 2.5	39	30	25
EJ Index for Ozone	40	33	26
EJ Index for 2017 Diesel Particulate Matter*	40	32	25
EJ Index for 2017 Air Toxics Cancer Risk*	39	33	24
EJ Index for 2017 Air Toxics Respiratory HI*	42	37	30
EJ Index for Traffic Proximity	9	8	7
EJ Index for Lead Paint	11	6	3
EJ Index for Superfund Proximity	11	6	3
EJ Index for RMP Facility Proximity	61	46	39
EJ Index for Hazardous Waste Proximity	34	27	24
EJ Index for Underground Storage Tanks	16	10	10
EJ Index for Wastewater Discharge	20	14	13

EJ Index for the Selected Area Compared to All People's Blockgroups in the State/Region/US



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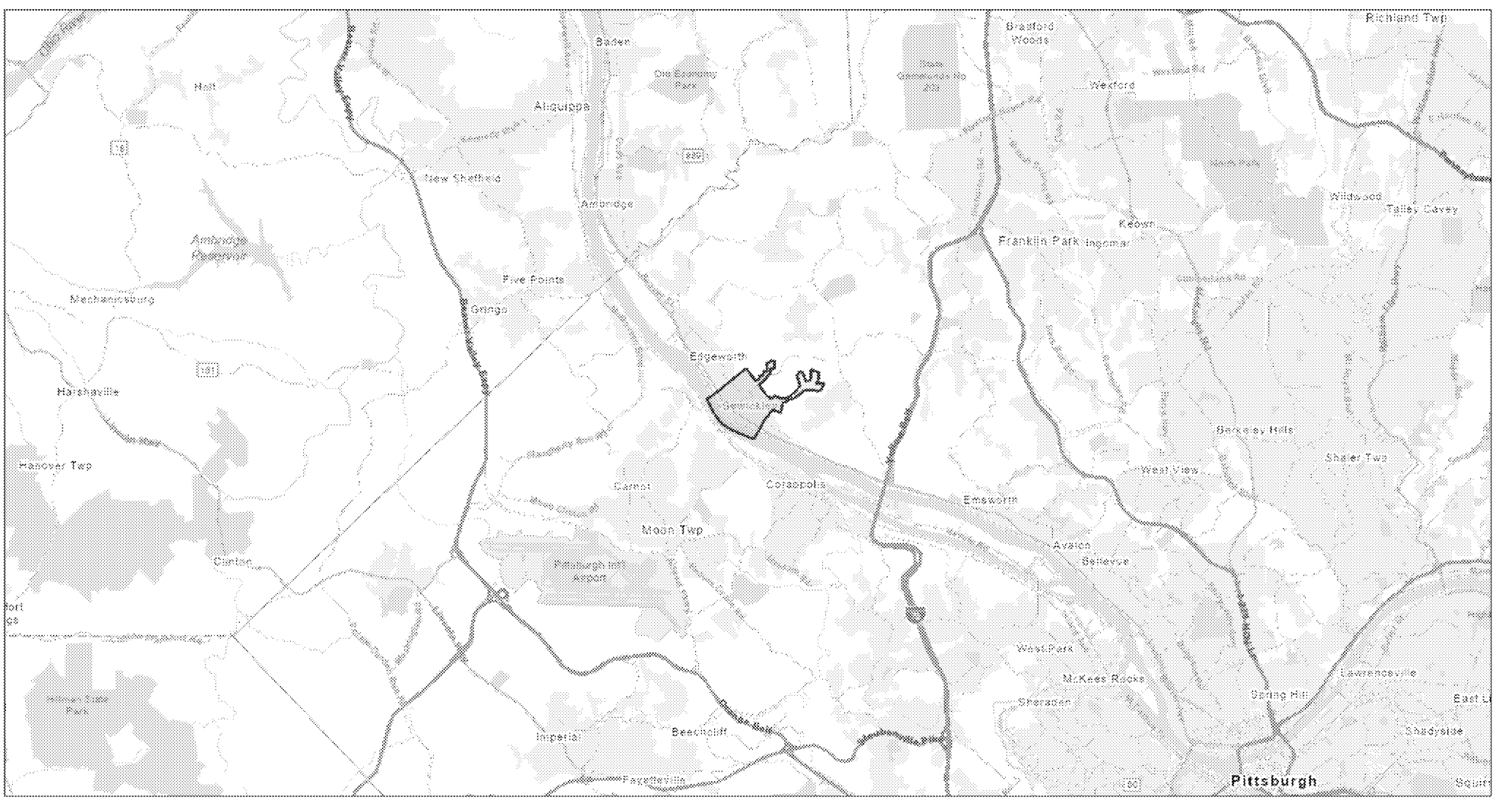

Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0

Selected Variables	Value	State		EPA Region		USA	
		Avg.	%tile	Avg.	%tile	Avg.	%tile
Pollution and Sources							
Particulate Matter 2.5 ($\mu g/m^3$)	9.4	8.72	86	8.2	94	8.74	72
Ozone (ppb)	45.4	42.1	99	41.9	93	42.6	78
2017 Diesel Particulate Matter* ($\mu g/m^3$)	0.237	0.269	44	0.267	<50th	0.295	<50th
2017 Air Toxics Cancer Risk* (lifetime risk per million)	30	31	84	30	80-90th	29	80-90th
2017 Air Toxics Respiratory HI*	0.3	0.32	67	0.34	50-60th	0.36	<50th
Traffic Proximity (daily traffic count/distance to road)	830	580	81	680	77	710	79
Lead Paint (% Pre-1960 Housing)	0.72	0.47	75	0.35	84	0.28	89
Superfund Proximity (site count/km distance)	0.4	0.19	90	0.15	92	0.13	93
RMP Facility Proximity (facility count/km distance)	0.13	0.81	15	0.63	25	0.75	21
Hazardous Waste Proximity (facility count/km distance)	0.61	1.4	48	1.9	49	2.2	47
Underground Storage Tanks (count/km^2)	3.2	3.4	69	2.7	74	3.9	68
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.017	66	70	33	78	12	73
Socioeconomic Indicators							
Demographic Index	16%	26%	40	30%	28	36%	20
People of Color	16%	24%	56	33%	39	40%	29
Low Income	16%	28%	31	27%	35	31%	27
Unemployment Rate	3%	5%	35	5%	35	5%	34
Linguistically Isolated	1%	2%	61	3%	58	5%	48
Less Than High School Education	2%	9%	12	10%	12	12%	11
Under Age 5	4%	6%	36	6%	34	6%	31
Over Age 64	21%	18%	68	16%	73	16%	77

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Other Attachment File(s)

*** Mandatory Other Attachment Filename:** 1234-Mandatory_Attachments.pdf

Add Mandatory Other Attachment | Delete Mandatory Other Attachment | View Mandatory Other Attachment

To add more "Other Attachment" attachments, please use the attachment buttons below.

Add Optional Other Attachment | Delete Optional Other Attachment | View Optional Other Attachment

Project Narrative File(s)

*** Mandatory Project Narrative File Filename:** 1238-Upper Ohio River Monitoring Grant_0322522_final.p

Add Mandatory Project Narrative File | Delete Mandatory Project Narrative File | View Mandatory Project Narrative File

To add more Project Narrative File attachments, please use the attachment buttons below.

Add Optional Project Narrative File | Delete Optional Project Narrative File | View Optional Project Narrative File

OMB Number: 4040-0004
Expiration Date: 12/31/2022

Application for Federal Assistance SF-424

* 1. Type of Submission:
- [ ] Preapplication
- [x] Application
- [ ] Changed/Corrected Application

* 2. Type of Application:
- [x] New
- [ ] Continuation
- [ ] Revision

* If Revision, select appropriate letter(s):

* Other (Specify):

* 3. Date Received: 03/25/2022

4. Applicant Identifier:

5a. Federal Entity Identifier:

5b. Federal Award Identifier:

State Use Only:

6. Date Received by State:

7. State Application Identifier:

8. APPLICANT INFORMATION:

* a. Legal Name: Community foundation for the Alleghenies

* b. Employer/Taxpayer Identification Number (EIN/TIN): 25-163-7373

* c. Organizational DUNS: 7999263290000

d. Address:

* Street1: 216 Franklin Street
Street2: Suite 400
* City: Johnstown
County/Parish:
* State: PA: Pennsylvania
Province:
* Country: USA: UNITED STATES
* Zip / Postal Code: 15901-1911

e. Organizational Unit:

Department Name:

Division Name:

f. Name and contact information of person to be contacted on matters involving this application:

Prefix: Mr.
* First Name: Mike
Middle Name:
* Last Name: Kane
Suffix:

Title:

Organizational Affiliation:

* Telephone Number: 814-225-1247
Fax Number:

* Email: mkane@cfalleghenies.org

Application for Federal Assistance SF-424

*** 9. Type of Applicant 1: Select Applicant Type:**

M: Nonprofit with 501C3 IRS Status (Other than Institution of Higher Education)

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

* Other (specify):

*** 10. Name of Federal Agency:**

Environmental Protection Agency

11. Catalog of Federal Domestic Assistance Number:

66.034

CFDA Title:

Surveys, Studies, Research, Investigations, Demonstrations, and Special Purpose Activities Relating to the Clean Air Act

*** 12. Funding Opportunity Number:**

EPA-OAR-OAQPS-22-01

* Title:

Enhanced Air Quality Monitoring for Communities

13. Competition Identification Number:

Title:

14. Areas Affected by Project (Cities, Counties, States, etc.):

Add Attachment | Delete Attachment | View Attachment

*** 15. Descriptive Title of Applicant's Project:**

Monitoring Chronic and Acute Pollution in the Upper Ohio River Valley

Attach supporting documents as specified in agency instructions.

Add Attachments | Delete Attachments | View Attachments

Application for Federal Assistance SF-424

16. Congressional Districts Of:

* a. Applicant: PA-013 * b. Program/Project: PA-017

Attach an additional list of Program/Project Congressional Districts if needed.

Add Attachment | Delete Attachment | View Attachment

17. Proposed Project:

* a. Start Date: 09/01/2022 * b. End Date: 08/31/2025

18. Estimated Funding ($):

* a. Federal	499,145.00
* b. Applicant	433,750.00
* c. State	0.00
* d. Local	0.00
* e. Other	0.00
* f. Program Income	0.00
* g. TOTAL	932,895.00

*** 19. Is Application Subject to Review By State Under Executive Order 12372 Process?**

☐ a. This application was made available to the State under the Executive Order 12372 Process for review on .

☐ b. Program is subject to E.O. 12372 but has not been selected by the State for review.

☒ c. Program is not covered by E.O. 12372.

*** 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes," provide explanation in attachment.)**

☐ Yes ☒ No

If "Yes", provide explanation and attach

Add Attachment | Delete Attachment | View Attachment

21. *By signing this application, I certify (1) to the statements contained in the list of certifications and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 218, Section 1001)**

☒ ** I AGREE

** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.

Authorized Representative:

Prefix: Mr. * First Name: Mike

Middle Name:

* Last Name: Kane

Suffix:

* Title: President

* Telephone Number: 814-225-1247 Fax Number:

* Email: mkane@cfalleghenies.org

* Signature of Authorized Representative: Mike Kane * Date Signed: 03/25/2022

BUDGET INFORMATION - Non-Construction Programs

OMB Number: 4040-0006
Expiration Date: 02/28/2022

SECTION A - BUDGET SUMMARY

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. Surveys, Studies, Research, Investigations, Demonstrations, and Special Purpose Activities Relating to the Clean Air Act	66.034	$	$	$ 499,145.23	$ 433,750.00	$ 932,895.23
2.						
3.						
4.						
5. Totals		$	$	$ 499,145.23	$ 433,750.00	$ 932,895.23

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SECTION B - BUDGET CATEGORIES

6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY				Total
	(1)	(2)	(3)	(4)	(5)
	Surveys, Studies, Research, Investigations, Demonstrations, and Special Purpose Activities Relating to the Clean Air Act				
a. Personnel	$ 306,000.00	$	$	$	$ 306,000.00
b. Fringe Benefits	0.00				0.00
c. Travel	7,956.00				7,956.00
d. Equipment	38,718.23				38,718.23
e. Supplies	19,821.00				19,821.00
f. Contractual	49,350.00				49,350.00
g. Construction					
h. Other	77,300.00				77,300.00
i. Total Direct Charges (sum of 6a-6h)	499,145.23				$ 499,145.23
j. Indirect Charges	0.00				$ 0.00
k. TOTALS (sum of 6i and 6j)	$ 499,145.23	$	$	$	$ 499,145.23
7. Program Income	$ 0.00	$	$	$	$ 0.00

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SECTION C - NON-FEDERAL RESOURCES

(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e)TOTALS
8. Surveys, Studies, Research, Investigations, Demonstrations, and Special Purpose Activities Relating to the Clean Air Act	$ 433,750.00	$	$	$ 433,750.00
9.				
10.				
11.				
12. TOTAL (sum of lines 8-11)	$ 433,750.00	$	$	$ 433,750.00

SECTION D - FORECASTED CASH NEEDS

	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	$ 222,074.56	$ 55,518.64	$ 55,518.64	$ 55,518.64	$ 55,518.64
14. Non-Federal	$ 144,583.32	36,145.83	36,145.83	36,145.83	36,145.83
15. TOTAL (sum of lines 13 and 14)	$ 366,657.88	$ 91,664.47	$ 91,664.47	$ 91,664.47	$ 91,664.47

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT

(a) Grant Program	FUTURE FUNDING PERIODS (YEARS) (b)First	(c) Second	(d) Third	(e) Fourth
16. Surveys, Studies, Research, Investigations, Demonstrations, and Special Purpose Activities Relating to the Clean Air Act	$ 222,074.56	$ 138,535.33	$ 135,535.33	$ 0.00
17.				
18.				
19.				
20. TOTAL (sum of lines 16 - 19)	$ 222,074.56	$ 138,535.33	$ 135,535.33	$ 0.00

SECTION F - OTHER BUDGET INFORMATION

21. Direct Charges:

22. Indirect Charges:

23. Remarks:

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Project Title: Monitoring Chronic and Acute Pollution in the Upper Ohio River Valley
Applicant Information: Breathe Project, a Program of the Community foundation for the Alleghenies
Address: 216 Franklin Street, Suite 400, Johnstown, PA 15901
Primary Contact: Mike Kane
Phone: 814-225-1247
Email: mkane@cfalleghenies.org
DUNS Number: 799926329
Set-Aside: no set-aside
Brief Description of Applicant Organization: The Breathe Project, a Program of the Community Foundation for the Alleghenies, is a coalition of citizens, environmental advocates, public health professionals and academics working to improve air quality, eliminate climate pollution and make Southwestern PA region a healthy and prosperous place to live. The Breathe Project engages over 50 regional organizations in science-based, public health work and community efforts to address ongoing and future injustices in our region's airshed.
Project Partners and Primary Contacts: Matthew Mehalik, Ph.D., Executive Director, Breathe Project, 1435 Bedford Ave., Suite 140, Pittsburgh, PA 15219, 412-514-5008, mmehalik@breatheproject.org
Project Location: Ambridge, Aliquippa, Beaver Falls, Coraopolis, East Rochester, Freedom, Leetsdale, Midland, New Brighton, Rochester, and adjacent communities of Beaver, Monaca, and Sewickley. These communities are located/situated in Beaver and Allegheny Counties in Southwestern Pennsylvania in the following zip codes: 15003, 15001, 15010, 15108, 15074, 15042, 15003, 15056, 15052, 15059, 15066, 15074, 15009, 15061, and 15143.
Air Pollutant Scope: PM2.5; VOC/HAPs (benzene, 1,3-butadiene, n-hexane and formaldehyde)
Budget Summary:

EPA Funding Requested	Total Project Cost
$499,145	**$932,895**

Project Period: September 1, 2022 – August 31, 2025
Short Project Description: The overall objective of this proposal is to engage environmental justice community members in the Upper Ohio River Valley in Southwestern PA, who are impacted by ongoing, chronic pollution levels and who will be impacted by future acute, episodic pollution levels from a regional petrochemical buildout, in community air monitoring activities. The project will involve community members in the design of monitoring plans, deployment of monitoring equipment, data collection, engagement in community data sensemaking, and coordination of communication and accountability campaigns so that air pollution conditions and community warning and protection capabilities advance in the Upper Ohio River Valley. The project will also link to a recently funded asthma registry and enhance the assessment of the impact of short-term and long-term pollution changes on asthma outcomes in these communities. Expected outcomes are: 1. Increased participation, awareness, knowledge and ongoing engagement of community members in UORV involving air quality; 2. Meaningful conversations and data bridge communications between impacted residents and regulatory agencies, such as PA DEP and EPA; 3. Increased capabilities for UORV community members to respond to acute, aperiodic pollution events so that protective actions can be taken; 4. Informed awareness about AQ data and health outcomes (asthma) in impacted communities; 5. Informed advocacy for accountability campaign efforts; 6. Informed public input to air quality standards and public health standards advocacy efforts.

Workplan

Project Summary and Approach

Our proposal, "Monitoring Chronic and Acute Pollution in the Upper Ohio River Valley," details a network of collaboration among key resident-led, air-pollution-impacted, community organizations in the Upper Ohio River Valley (UORV) stretching from the outskirts of the City of Pittsburgh through Beaver County (BC), PA and encompassing the air shed of toxic pollutants generated by existing and under-construction industrial point sources located in the UORV. Specifically, these community organizations include Beaver County Marcellus Awareness Community (BCMAC), BC NAACP, BC United, Community First Sewickley Valley (CFSV), the Community Monitoring Project (CMP), Coraopolis NAACP, and Protect Franklin Park (PFP), which proactively engage residents in the environmental justice (EJ) index-impacted communities of Ambridge, Aliquippa, Beaver Falls, Coraopolis, East Rochester, Freedom, Leetsdale, Midland, New Brighton, Rochester, and adjacent communities of Beaver, Monaca, and Sewickley. These communities are situated in BC and Allegheny County (AC) in Southwestern Pennsylvania (SWPA) and are **already significantly affected by legacy air pollution sources and expect greater air pollution burdens** as the petrochemical industry expands throughout this corridor with new sources of pollution. Our proposal expands on and greatly enhances the capabilities of a nascent array of air monitoring equipment that these grassroot community groups have installed over the past two years. **Our goal is to incorporate a greater number of and a larger array of high quality-monitoring devices to accurately address monitoring gaps and episodic emissions and cover a larger range of pollutant types to deepen resident understanding of these communities' air pollution burdens.** Of special interest is our intention to grow the capability to understand and respond to aperiodic, acute air pollution episodes from unplanned releases of current and future point-source polluters as a direct result of petrochemical buildout in this region which is prone to weather inversions that will trap that pollution close to the ground. These aperiodic, acute events are of paramount concern that will require greater specificity of documentation for residents to engage in effective community education, regulatory enforcement, and actionable plans for accountability and remediation. Additionally, we plan to use the proposed air monitoring results to assess the short- and long-term impacts of air pollution on asthma outcomes.

Project Significance

The primary locations wherein the benefits of the project will be realized are in the EJ-Index impacted communities of Ambridge, Aliquippa, Beaver Falls, Coraopolis, East Rochester, Freedom, Leetsdale, Midland, New Brighton, Rochester (population 45,036), and adjacent communities of Beaver, Monaca, and Sewickley (population 14,873), a total of 58,720 people, according to the latest EJ Screen V. 2.0 demographic information. These communities are in BC and AC in SWPA. **These communities are already perilously impacted by legacy PM 2.5 and ozone air pollution sources.** They have high cancer risk from point source air pollution as well as high rates of acute asthma, heart disease and early deaths documented in the medical literature and by EJ Screen data. Residents in this area also fear greater air pollution burdens as the petrochemical industry, motivated by profit and lax local environmental regulations, extends itself throughout this corridor with new sources of burdensome pollution. Community EJ metrics for the participating communities are presented below and attached as appendices. **The project will also address these indicators of poor health outcomes by engaging medical experts in the fields of pulmonary disease and asthma to create an asthma registry and bolster asthma care capabilities in these impacted communities.** The ability to simultaneously document outbreaks of asthma attacks by severity in a spatial juxtaposition to localized emissions will markedly enhance our ability to forewarn the public and raise critical awareness to the pernicious effects of specific pollutants. The overall significance of this project involves the mobilization of a large network of community members in EJ-impacted areas by engaging key community partner organizations in collecting air quality information. This will enable these individuals to engage in campaigns that address ongoing (chronic) as well as anticipated (acute) pollution episodes, improving overall UORV air quality and protecting

themselves from future spikes in pollution. Additionally, the project connects impacted communities with asthma-related and other health resources to improve public health outcomes.

Community Partnerships

Project Management and Coordination

Breathe Project – Project Host and Network Coordinator **is a SWPA organization that connects residents with top-level health, epidemiological, and air quality science and public health information.** We are 50+ organizations working to improve air quality, eliminate climate pollution and make our region a healthy and, in turn, prosperous place for residents to live and work. We are comprised of public health professionals, academics, environmental advocates, and residents. We use the best available science and technology to better understand the quality of the air we breathe and provide opportunities for citizens to engage and to act. BP coordinates activities to hold polluters, regulators, and leaders accountable to reduce/eliminate existing regional air quality threats, especially from legacy fossil fuel and metals industries. BP also organizes campaigns to address new airshed threats from expanding petrochemical infrastructures in the UORV. Notably, BP supports community members who are the main voices in public conversations and debates on air quality and accountability. BP staff serve in organizing roles for the hosting of campaigns calls, production of events, communication materials, videos, talking points, and technical comments across a range of air quality and public health community situations. BP has focused on key initiatives in BC, the site of the petrochemical infrastructure under construction. These campaigns maintain close collaboration with community groups listed below. The campaigns currently involve over 150 people across 35 different community groups. Moreover, **BP brings its extensive experience at building, maintaining, and managing networks of engagement to connect community members and groups with air quality, public health, and environmental expertise.**

Key Partners in Community Engagement

Beaver County Marcellus Awareness Community (BCMAC) was formed in 2011 to protect the residents of SWPA, with emphasis on those in BC, by informing them about the health, safety, environmental and economic impacts of fracking infrastructure, including the petrochemical buildout; and by supporting sustainable alternatives to carbon-based sources of economic development strategies in BC. **BCMAC commits to locating hosting sites for air monitors, disseminating information, leading and participating in community meetings to discuss monitor data and what findings reveal about health risks to the life of our community. BCMAC will also lead enforcement campaigns.**

Beaver County (BC) NAACP and Beaver County United (BCU): BC NAACP works to ensure the political, educational, social and economic equality of rights of all persons and to eliminate racial hatred and racial discrimination in BC. BCU organizes with people by connecting issues with politics and building a multi-racial, working-class movement for long-term change. **Both will join BCMAC and other regional groups in locating hosting sites for air monitors, disseminating information about pollution impacts on residents' health and discussing with their members what monitor data findings reveal about health risks to the life of our community. Both will also engage and mobilize to support accountability and enforcement campaigns** to hold polluters accountable.

Community First Sewickley Valley (C1) represents the 11 municipalities located 12 miles along the Ohio River from Beaver, PA in BC to Pittsburgh. C1 has already engaged several residents in hosting Purple Air monitors; however, more are needed to determine pollution patterns. **C1 is committed to installing additional site-specific monitors to measure air pollution in UORV and to participate in a centralized method to collect and understand long- and short-term episodic data. C1 will also engage in communication efforts** to engage and inform residents in their service territory.

The Community Monitoring Project (CMP) is an initiative supported by community members to deploy 40 low-cost air monitors around the Shell Petrochemical Facility in BC CMP's mission is to empower community members to watch air quality conditions around the Shell facility so they can better hold Shell accountable for public health and safety. Monitors include PurpleAir and Airviz units, both of which

measure VOC and PM. **CMP has crafted an extensive list of monitor host candidates in and around BCCMP and will use its monitoring expertise and contacts to support this project.**

Coraopolis NAACP seeks to address environmental inequities at the local level and develop a comprehensive and holistic agenda to reduce pollution. Their members have participated in conference calls with the group designing the project. **Their members will host monitors provided by this project. Members with asthma will be involved in the asthma registry connected to this project. They will engage members at our monthly meetings** with the results and actions that can be taken to protect against adverse health impacts.

Protect Franklin Park (PFP) is dedicated to protecting the health, safety, and well-being of its residents through information, action, and advocacy. PFP focuses on health risks associated with PM2.5 coming from industries in UORV and Pittsburgh. PFP expects air pollutants emitted by the Shell ethane cracker plant nearby in BC (18 miles northwest of their borough) to have a major impact on its air quality. PFP has worked with their local council to install a *PurpleAir* monitor in a public recreational area and will install more monitors near their borough's western and northwestern boundaries. PFP advocates for the inclusion of air quality monitoring in the multi-municipal plan currently being developed by FPB and Ohio Township. **Increased monitoring and scientifically reliable information about air quality in UORV will greatly assist PFP in local advocacy. PFP will inform residents and local officials of FBP and neighboring communities about air quality issues.**

Key Partners in Air Quality Science and Monitoring Technology

Carnegie Mellon University Center for Atmospheric Particle Studies (CAPS)'s goal is to advance the state of knowledge, provide both policy-relevant research, and to participate directly and actively in the evolution of environmental policy related to air quality. CAPS is recognized internationally as a leader in the study of air quality and atmospheric chemistry. **CAPS already collaborates closely with many partners in this proposed project. CAPS maintains a network of low-cost air pollutant sensors across the Pittsburgh region, and a key focus area is UORV**. These sensors are deployed in collaboration with area residents and community groups. We provide weekly reports on the sensor measurements, and present at community meetings to report findings. **CAP will continue to support the sensors in the UORV and expand/adjust the network in accordance with community requests.**

Carnegie Mellon University CREATE Lab is a community-focused technology empowerment and partnership organization. Create Lab works on ways to better monitor and understand pollution, adding to and visualizing the large network of air monitors set up and run by government agencies, universities, and residents alike. Create Lab directly monitors some of our region's largest pollution sources, and some of their newest work combines monitoring with very detailed weather models to better understand real-time exposure from large industrial sources. For this project, **CREATE Lab will provide and maintain the Environmental Sensing Data Repository (ESDR) infrastructure service for aggregation of air monitor data. Lab staff will integrate new sensors acquired through the grant into these platforms, and iterate on platforms based on community, partner, and government stakeholder feedback. CREATE Lab will engage partners in the project and create tailored analyses and visualizations** that will enhance reports, such as forward dispersion and back trajectory modeling.

Clean Air Council (CAC) is a member-supported environmental organization serving PA. Dedicated to protecting and defending everyone's right to a healthy environment, the CAC's team of policy analysts, planners, environmental health educators, engineers, attorneys, and community organizers work through a broad array of related sustainability, public health, and ecosystem protection initiatives. **CAC will support this project by providing an in-kind donation of staff time on technical advice and support on air monitors, placement, data interpretation, and community outreach.** Specifically, CAC will train 6-8 area residents in how to access and monitor the website Shell is creating to display public data on its required fence line monitoring system; understand when there is a pollution event; report exceedances to appropriate entities; and communicate exceedances to the public. In addition, CAC will train 10 BC

residents to use 10 independent monitors to collect data on potential impacts of emissions from the plant, to assist these community members to place these monitors in identified gap zones, to analyze the data to draft public summary reports, and to engage the public and PADEP about potential air quality issues, including expertise in enforcement and regulatory issues.

Environmental Health Project (EHP) is a nonprofit public health organization that defends public health from shale gas development. EHP collects, analyzes, and presents shale gas exposure information that informs frontline communities and empowers them to advocate. EHP works with individuals, communities, and health professionals to educate residents on exposure pathways, health impacts, and to promote the adoption of strategies that better protect them from shale gas pollution. EHP advocates for a health-protective approach to shale gas industry regulation that places health and wellbeing at the center of policy decisions and ensures safety and health for all. For this project, **EHP will provide data analysis through our AirView App to interpret and help communicate information collected by the air quality monitors** deployed through this grant. Data analysis and interpretation will allow communities to determine the extent of episodic exposures in their community, and how that can impact their health.

Key Partners in Public Health

Community Partners in Asthma Care (CPAC's) mission is to provide asthma education, research, and medical care to EJ communities. **CPAC will partner with Pitt Public Health to initiate an Asthma Registry among residents of the UORV**. CPAC has received funding from a local foundation to enroll 500 residents from the UORV during the first year of this project and then will conduct follow-up visits annually and during any acute events of air pollution exposure. This approach will allow the team to **document the impact of both acute and chronic exposure to air pollution on asthma outcomes.** Because the work to initiate an Asthma Registry among residents of the UORV is already funded, this work will be offered in-kind on this project. CPAC is well positioned to engage in this work since we have an established track record of successfully completing such community-based health studies.

Environmental and Occupational Health (EOH) Department at the University of Pittsburgh School of Public Health (Pitt Public Health) and the University of Pittsburgh Asthma and Environmental Lung Health Institute (AELHI) are recognized for major contributions to research in multiple areas of public health on the local, national, and international levels. AELHI is dedicated to improving the health and wellness of patients with asthma and other environmentally linked lung diseases and is home to the Asthma Institute Research Registry (AIR). AIR has enrolled over 2,000 patients from our region who are richly characterized using questionnaires, pulmonary function testing and available blood samples. Their registry data can be enhanced by electronic medical record (EMR) links as well, which capture asthma exacerbations. AELHI has recently invested in a highly versatile and flexible new database system allowing us to follow our participants on a yearly basis and as acute needs arise. In partnership with CPAC, **EOH has received funding to expand AIR to enroll and follow 500 patients with asthma residing in UORV**. All participants will be geocoded and complete annual visits that include questions about their medical history and environmental exposures. They will perform breathing tests and agree to have their EMR information added to the registry. Once patients are enrolled in the study, they will be contacted for future studies if acute air pollution events occur in UORV. **This approach will allow us to study the impact of both long-term and short-term exposure to air pollution on asthma outcomes in this population.** EOH will actively engage with the work of this proposal, including designing the project, examining/analyzing data, participating in community health educational initiatives and meetings, and communicating outward to the larger community and policy makers. Thus, **this is a perfect partnership among community groups, foundations, academia, tied together by EPA funding.**

University of Pittsburgh's Center for Healthy Environments and Communities (CHEC)'s mission is to apply a data- and fact-based approach to understand regional environmental health issues and make them accessible to stakeholders. **CHEC will provide a robust connection of monitoring data identified in this project to health-related risks.** This will include simple risk-based models to illustrate health risks

associated with the patterns and changes of air quality, as well as more sophisticated health tracking and surveillance protocols using electronic medical records and AIR Registry.

Community Engagement

The partners that have come together for this project through the BP network have long standing relationships and direct ties to community members in the UORV. Consequently, the key partners already have community members participating in community conversations about air quality. The community engagement plan builds upon this foundation of community partnerships. **Community members will have the opportunity to participate in informational meetings that are tailored to the needs of their membership.** This means holding community meetings at times that accommodate stakeholders who work during the day, in public meeting places within the impacted communities that are easily accessible by public transportation. This also means offering the ability to attend using online video conferencing in addition to convenient in-person options. Informational meetings will include providing opportunities for community members to relate how air pollution has impacted them and their families. Information about air pollution will be made available to participating community members. They will receive presentations about air monitors during recruitment meetings and be offered visits to provide background on what is involved with hosting a monitor. Support will be provided for the installation of monitoring equipment including assistance for ensuring that proper power supply and internet connection capabilities are functioning. Regular, monthly meetings for participating cohorts among community groups will be supported so that key questions about troubleshooting and maintenance are addressed. Data reports from the collected data will be compiled and discussed with community members, including discussions about trends and comparisons about background, chronic pollution levels, and any unanticipated acute pollution episodes. Community members will be supported in any accountability campaigns they wish to pursue, such as writing letters to enforcement agencies, writing letters to editors of local media, as well as public meetings support, e.g., offering testimonies at public gatherings or via press events and media interviews. BP and its network have a long-standing record of supporting all these practices in community air quality engagement.

Environmental Justice and Underserved Communities

Because of the UORV's extensive and long-standing industrial legacy, the **communities involved in this proposal currently bear a significant burden of exposure to and health impacts from chronic air pollution. EPA's EJ Screen provides a clear picture of these burdens**, such as elevated EJ index scores for PM2.5, ozone, and NATA Cancer Risk from point source pollution as well as high health burden rates of asthma, heart disease, and early deaths. **Figure 1** shows the proportion of population from communities involved in the proposal falling into various EJ index percentiles as compared to other communities in Pennsylvania. Of the 58,720 people involved in communities for this project, **43,847 people (75% of total) reside in communities ranked above the 70th percentile for PM 2.5, ozone, and point source cancer risk.** In terms of health disparities, the participating communities have relatively high rates of asthma. Of all residents in the participating communities, **36,355 (62%) reside in communities above the 95th percentile for asthma**, based on EPA's EJ Screen 2.0 data.

Community	Population	PA EJ Index PM 2.5 (%ile)	PA EJ Index Ozone (%ile)	PA EJ Index Cancer Risk (%ile)
Ambridge	9004	79	79	79
Aliquippa	6707	85	85	85
Beaver	4334	43	43	42
Beaver Falls	8464	79	79	80
Conaopolis	5488	76	76	75
East Rochester	472	72	72	72
Freedom	1532	73	73	73
Leetsdale	1189	61	62	60
Midland	2918	76	76	76
Monaco	5521	42	42	41
New Brighton	5761	75	75	75
Rochester	3501	77	77	77
Sewickley	3829	39	40	39
> 70%ile	43847			
> 50 %ile	45036			
< 50 %ile	14873			
Total	58720			

Figure 1: EPA PA EJ Indices and Corresponding Population for Participating Communities for PM 2.5, Ozone, and NATA Cancer Risk, based on EPA's EJ Screen Tool, Version 2.0.

Community	Population	Asthma %ile
Ambridge	9004	95 - 100
Aliquippa	6707	95 - 100
Beaver	4334	70 - 80
Beaver Falls	8464	95 - 100
Conaopolis	5488	70 - 80
East Roches	472	90 - 95
Freedom	1532	90 - 95
Leetsdale	1189	80 - 90
Midland	2918	95 - 100
Monaco	5521	90 - 95
New Brighto	5761	95 - 100
Rochester	3501	95 - 100
Sewickley	3829	50 - 60
95 - 100	36355	
90 - 95	7525	
80 - 90	1189	
70 - 80	9822	
< 70	3829	
Total	58720	

Figure 2: EPA Acute Asthma Percentiles and Corresponding Population for Participating Communities, based on EPA's EJ Screen Tool, Version 2.0.

Of this same population, 54,891 people (93%) reside in communities above the 70th percentile for asthma **(Figure 2).** The communities also rank poorly in terms of heart disease and early deaths. EJ Screen Version 2.0 reports for these EJ measures are included in the attachments to this proposal. COVID-19 mortality is linked to EJ burdens, including air pollution exposure. **BC bears a higher burden of mortality due to COVID-19 (1.82% vs 1.59% for PA**; Johns Hopkins COVID-19 Dashboard; report included in proposal attachments). The project will address these disparate environmental justice factors by engaging residents in air quality monitoring, data discussions, and in supporting advocacy efforts.

Outcomes, Outputs, and Performance Measures

Outputs	Outcomes
▪ Community groups are convening monthly and involving impacted community members ▪ A robust plan for deploying monitors involving community members is created with community input ▪ New monitors are added to existing monitoring network strategically ▪ New monitors are added to network to anticipate acute, episodic pollution events ▪ Monitoring network is maintained; data is collected reliably ▪ Monthly data analysis reports in the hands of community members ▪ Insights into data trends shared with community groups ▪ Asthma analysis information is shared with community members once published	▪ Increased participation, awareness, knowledge and ongoing engagement of community members in UORV involving air quality ▪ Meaningful conversations and data bridge communications between impacted residents and regulatory agencies, such as PA DEP and EPA Region 3 ▪ Increased capabilities for UORV community members to respond to acute, aperiodic pollution events so that protective actions can be taken ▪ Informed awareness about AQ data and health outcomes (asthma) in impacted communities ▪ Informed advocacy for accountability campaign efforts

▪ Asthma health support measures are deployed in impacted communities ▪ Create and deploy episodic pollution notification communication methods and procedures	▪ Informed public input to air quality standards and public health standards advocacy efforts.

Timeline, Milestones, and Performance Measures

Start	End	Activity/Milestone	Performance Measures (Outputs)
9/1/22	11/30/22	Connect with residents through existing relationships, community partnerships and preexisting monitoring networks	Impacted community members engage with the project and agree to participate
10/1/22	2/28/23	Conduct listening sessions with residents about air quality and health concerns	A robust plan for deploying monitors involving community members is created with community input
10/1/22	2/28/23	Engage with residents to gather input on monitor placement and maintenance to address gaps in the existing monitoring network	Community groups convene monthly and involve impacted community members
9/1/22	8/31/25	Management team meets monthly to review project progress	Project tracking and progress documented
10/1/22	3/31/23	Engage residents in designing a new plan for and deploying new monitors in anticipation of acute, aperiodic pollution episodes due to petrochemical buildout	A robust plan for deploying monitors involving community members is created with community input; New monitors are added to network to anticipate acute, episodic pollution events
11/1/23	8/31/25	Gather feedback from engaged network of residents as monitors are deployed to ensure monitoring network is maintained in community listening sessions.	Community groups are convening monthly and involving impacted community members; Monitoring network is maintained; data is collected reliably
10/1/22	8/31/25	Collect data from the monitoring network	Community groups are convening monthly and involving impacted community members; Monitoring network is maintained; data is collected reliably

10/1/22	3/31/23	Connect monitoring network data to EHP data dashboard	Monitoring data is accessible and secure
11/1/22	8/31/25	Analyze data from the monitoring network	Insights into data trends and correlation/causality of asthmatic trends with pollution events shared with community groups
3/1/23	8/31/25	Compare monitoring data with asthma and other health outcomes data	Asthma data analysis is completed Asthma analysis information is shared with community members once published
3/1/23	8/31/25	Provide monthly summaries of monitoring data to community groups for discussion at community meetings.	Monthly data analysis reports in the hands of community members
9/1/23	8/31/25	Provide data summaries and analysis quarterly to PA DEP and EPA Region 3 documenting ongoing project results.	Briefings and quarterly reports shared with PA DEP and EPA Reg. 3
5/1/23	8/31/25	Programs, presentations and communications for public and local government education and participation	Create and deploy episodic pollution notification communication methods and procedures
2/1/23	8/31/25	Asthma registry engagement and outreach are connected to participating community members.	Asthma health support measures are deployed in impacted communities
6/1/25	8/15/25	Final report preparation	Final report shared with PA DEP and EPA Region 3

Past Performance

The Breathe Project has managed a portfolio of grants successfully over the past three years:

- Heinz Endowments Program Support Grant Ref. E5326 ($800,000) (Ended 6/2020; completed and reported on successfully; outcomes Achieved)
- Heinz Endowments Grant Ref. E7145 ($45,000) for Earth Day 2020 Organizing (Ended 10/2020; completed and reported on successfully; outcomes Achieved)
- Ohio River Valley Petrochemical Fund ($35,000) for BCMAC Beaver County Safety and Accountability (Ended 10/2021; completed and reported on successfully; outcomes Achieved)
- Tides Foundation Grant Reference #: TF2005-091320 for Communications Campaigns ($50,000) (Ended 9/2021; completed and reported on successfully; outcomes Achieved)
- Pittsburgh Foundation for Stopping Rail Pollution ($15,000) (Ended 6/2021; completed and reported on successfully; outcomes Achieved)

Key Personnel Expertise

Matthew M. Mehalik, Ph.D., PI, serves as the Executive Director of the Breathe Project where he coordinates the efforts of 50+ regional organizations in a collaboration to improve air quality in SWPA. His expertise is in management of shared expertise, program management, and systems engineering. From

2007 – 2016, he served as Program Director, Sustainable Pittsburgh, where he created Pittsburgh's sustainable business network, Champions for Sustainability, and its performance programs. He teaches policy, resiliency, and sustainability courses at Heinz College, Carnegie Mellon University since 2008. He has published multiple peer-reviewed articles in sustainability, design, ethics, and education and has co-authored *Ethical and Environmental Challenges to Engineering*.

Mark Dixon is an award-winning filmmaker, activist, and public speaker exploring the frontiers of social change on a finite planet. Mark graduated from Stanford University in 1997 with a degree in Industrial Engineering. He started his technology career in Silicon Valley and worked for two start-up companies, including Akimbo Systems, where he managed the deployment of nearly 10,000 programs for its Internet video service. As a part of his most recent film project, Mark facilitated the deployment of over 100 low-cost PurpleAir monitors throughout SWPA. Mark received recognition for clean air advocacy when named Group Against Smog and Pollution Champion for Healthy Air in 2017.

Dr. Sally Wenzel is the Rachel Carson Chair in Environmental Health, Chair of the EOH Department, and Director of AELHI at Pitt Public Health. She is recognized as a world-renowned translational researcher, educator and clinician in asthma. Dr. Wenzel studies severe asthma and its phenotypes from the clinical-environmental to the molecular and genetic level. She has recruited hundreds of severe asthma patients for human-based research studies. She is one of the key scientists initiating the concept of asthma phenotypes and has led groundbreaking clinical trials of Type-2 targeted therapies published in the New England Journal of Medicine and the Lancet. Dr. Wenzel is one of seven NHLBI-funded investigators in the Severe Asthma Research Program (SARP) network, a network she has been a central part of for over 20 years. She is also Co-PI on a P01 grant on severe asthma. As chair of EOH at Pitt Public Health she addresses the interactions of various pollutants, oxidative stress and epithelial cells with airway diseases like asthma. She developed and oversaw the AIR Registry that has enrolled over 2,000 patients from SWPA. In partnership with CPAC, her team has secured foundation funding to expand the AIR Registry to include 500 patients with asthma from the UORV. She has authored more than 350 publications and is the recipient of numerous awards for her work in asthma.

Douglas Krings is an environmental consultant providing clients in chemical and energy industries with tailored and optimized support in air permitting and reporting, NPDES permitting, auditing and site remediation and closure activities. He has served as a Senior Technical Specialist providing a variety of environmental, health and safety consulting services, including compliance auditing, regulatory interpretation, air quality, EHS management, due diligence, and wastewater engineering. In his 46 years of experience, he has managed all facets of permitting efforts (Title V, NPDES, RCRA Part B). He served as Co-Chair of American Chemistry Council (ACC) air team and provided air dispersion modeling support to sites and business units for construction permitting and air toxics assessments.

Project Budget

Monitoring Chronic and Acute Pollution in the Upper Ohio River Valley

				Federal	Cost Share
Personnel					
Salary and Wages	*hourly rate*	*hours/week*	*total weeks*		
Principal Investigator					$75,000.00
Project Manager	$29.00	40	150	$174,000.00	
Maintenance Technician	$22.00	40	150	$132,000.00	
Total Personnel				**$306,000.00**	
Travel	*mile/wk*	*mileage rate*	*total miles*		
Staff travel	300	$0.17	46800	$7,956.00	

Total Travel				**$7,956.00**	
Equipment	*# units*	*unit cost*			
PM2.5 monitors	100	$237.38		$23,737.50	
VOC monitors	10	$350.00		$3,500.00	
Total monitors	110	$247.61	$27,237.50		
Bucket brigade kits	5	$596.15		$2,980.73	
Handheld monitor	1	$4,000.00		$4,000.00	
Sample pumps	2	$1,000.00		$2,000.00	
Computer	1	$2,500.00		$2,500.00	
Total Equipment				**$38,718.23**	
Supplies	*# units*	*unit cost*			
Installation supplies	60	$60.00		$3,600.00	
Replacement sensors	61	$45.00		$2,745.00	
Sorbent tubes	200	$4.88		$976.00	
Portable air cleaner	50	$250		$12,500.00	
Total Supplies				**$19,821.00**	
Contractual	*# units*	*unit cost*			
Monitors support				$18,750.00	
Technical support					$48,750.00
Monitor host stipend	50	$150		$7,500.00	
Tedlar bag analysis	35	$350		$12,250.00	
Sorbent tube analysis	35	$250		$8,750.00	
Summa canister analysis	6	$350		$2,100.00	
Laboratory analysis			$23,100.00		
Total Contractual				**$49,350.00**	
Other					
Asthma Registry				$20,000.00	$310,000.00
AirView Support				$21,500.00	
Community Foundation for the Alleghenies				$25,000.00	
Community Meeting Logistics	24	$450.00		$10,800.00	
Total Other				**$77,300.00**	
Total Funding				**$499,145.23**	**$433,750.00**
Total Project Cost					**$932,895.23**

Budget Narrative

This project consists of 4 major parts: 1. installation and maintenance of continuous monitors; 2. air sampling during episodic pollution events; 3. establishment of an asthma registry for the study region; 4. community engagement, particularly EJ communities. The PI's time is a Breathe Project in-kind contribution. The PI reserves authority for project decisions, including hiring of the project manager (PM) and maintenance technician (MT). Candidates will be recruited from project EJ

communities. The PM will be engaged in all parts of the project. The PM will engage with partners and community members to select hosts for the project monitors (parts 1 & 4), develop and provide training to bucket brigade members (2 & 4) and assist Dr. Gentile in identifying and setting up office space for the asthma registry (3). The MT will engage with parts 1, 2, and 4 of the project. The MT will install and maintain continuous monitors (1). MT will execute episodic sampling (2) and will attend community outreach meetings (4). PM and MT will be reimbursed for travel to install and maintain monitors (1), participate in training for episodic sampling (4) and occasionally lead in sampling events (2). PM2.5 monitors will be 45 PA-II, 5 PA-II SD and 50 PA-I for part 1; they also facilitate community engagement in the host selection process (4). PA-I units are for indoor use by EJ participants interested in mitigating indoor exposures (4). Airviz VOC monitors relate to parts 1 and 4. Bucket brigade kits (part 2) involve community engagement (4) to volunteer-staff the brigades. The handheld PID instrument will support bucket brigades (2) to locate VOC maximums and document readings during sampling. The sample pumps support sampling (2) using sorbent tubes by bucket brigade volunteers (4). Portable air cleaners (Corsi-Rosenthal box filters) will be supplied to EJ community residents (4) to address potential health impacts of PM 2.5. Experienced personnel from one project partners assist staff and EJ community members with maintenance of their monitors (1). Technical support comes from in-kind contributions from environmental professionals from the partner organizations. They will assist data interpretation and analysis (1 & 2). The project will provide a modest stipend to EJ community member monitor hosts (4). Analysis of tedlar bags produced in bucket brigade sampling (2) produces results for presentation and discussion at community forums (4). Similarly, sorbent tube and summa canister analysis support parts 2 and 4. Asthma Registry (3) for the study region complements the in-kind contribution of that project to the health impacts/pollution analysis that will be done with joint data. AirView is the data collection and analysis tool for analyzing data generated by continuous monitors (1). CFA reflects the 5% management fee for administrative host for the project (1-4). Community meetings (4) will be used to solicit input from community members and provide feedback on results.

Expenditure of Awarded Funds

The Community Foundation for the Alleghenies maintains detailed procedures and controls for ensuring that awarded grant funds will be expended in a timely and efficient manner. The review of expenditure responsibility for all grants includes: a pre-grant review; a written grant agreement that specifies the use of funds only for the purpose described in the grant application and subsequent grant notification letter; notification of and obtain its consent to any substantial deviation from said purpose; to not use the funds for any purpose prohibited by law; to maintain its books and records to show, and separately account for, the funds received; to maintain records of expenditures adequate to identify the purposes/manner in which grant funds are expended; reasonable access to the grantee's records for financial audits, verifications, and investigations concerning the grant; to maintain records for at least four years after completion/termination of the project; to submit an online Final Grant Report; to certify that the organization does not directly or indirectly engage in or support any terrorist activity; and keeping documentation about the grant with a brief description of the grant, amount, charitable purpose, and current status of the grant.

Monitoring Chronic and Acute Pollution in the Upper Ohio River Valley Project

Standard Operating Procedure
Purple Air PA-II and PA-II SD Monitors

Effective date 9/1/2022

SOP Reviewed and Approved

Quality Assurance Manager

3/24/2022

This SOP was adapted from a draft SOP developed by US EPA Office of Research and Development

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Figures

Purple Air PA-II-SD Standard Operating Procedure

1 Scope and Applicability

This standard operating procedure (SOP) describes the procedures for operating and recovering data from the PurpleAir (PurpleAir LLC) PA-II-SD particulate matter (PM) sensor. In this SOP, instructions are provided for deployment, startup, wireless connection, operational verification, data download and data import into Microsoft Excel. Data from the PurpleAir sensors can be compared with collocated reference grade monitors to evaluate accuracy, precision, and bias of the sensor measurements relative to the reference concentrations, as well as variability in the response between the sensors. The Purple Air Sensor can be used for a variety of applications including ambient monitoring and research, indoor air quality investigations, atmospheric and climate research, and health studies.

2 Background

The PurpleAir sensor will collect data at an ambient air quality monitoring site. The PurpleAir PA-II-SD uses a PMS5003 laser particle counter to report concentrations of PM_1, $PM_{2.5}$, and PM_{10} ($\mu g/m^3$) along with particle counts in several size bins (<0.3µm, <0.5µm, <1µm, <2.5µm, <5µm, and <10µm) as well as temperature (T), relative humidity (RH), and pressure (P). PM is detected via laser scattering with an effective range of 0-500 $\mu g/m^3$, a maximum range of 1000 $\mu g/m^3$, with a counting efficiency of 50% at 0.3 µm and 98% for >=0.5 µm. The operable temperature range is between -20 and 60 ◦C, with a RH range of 0-99% and a pressure of 300-1100 hPa. The PurpleAir records data at a 2-minute (as of firmware versions 4.02 or later, updated across devices on 5/31/19) averaging interval on an internal microSD (Secure Digital) card up to 64 GB. Previous firmware recorded data at 80-second intervals so historic data was logged at this rate and any devices that have not been updated to the current firmware version will as well.

3 Definitions/Acronyms

µm	micrometer
°C	degree(s) Celsius
AC	Alternating Current
CHP	Chemical Hygiene Plan
EPA	U.S. Environmental Protection Agency
GFCI	Ground Fault Circuit Interrupter
Ghz	Gigahertz
hPa	Hectopascals
P	pressure
PPE	Personal protective equipment
PM	Particulate Matter
PM_1	particulate matter with diameters < 1 µm
$PM_{2.5}$	particulate matter with diameters < 2.5 µm
PM_{10}	particulate matter with diameters < 10 µm
PVC	Polyvinyl chloride

RH	Relative Humidity
SD Card	Secure Digital Card
SSID	Service set identifier
T	Temperature
UL	Underwriters Laboratories
USB	Universal Serial Bus
UTC	Coordinated Universal time
WACOR	work assignment contracting officer's representative
WAL	work assignment leader
WiFi	Wireless Fidelity

4 Health and Safety

Standard laboratory PPE should be worn at all times during the operation of the PurpleAir sensors in the lab, in accordance with the U.S. Environmental Protection Agency (EPA) CHP. During outdoor deployment, site-specific safety protocols and procedures should be followed. Additionally, due to the inevitable exposure of the PurpleAir to inclement weather, ensure that all electrical connections are made in a manner that protects all electrical connections from water intrusion.

5 Cautions/Interferences

As outlined in sections 8.2-8.5, to mitigate the risk of data loss all directions to power on and power off the unit must be strictly followed. Improper powering procedures could cause data corruption and sensor damage. As with any air monitoring instrumentation, certain precautions should be taken in the installation of the equipment. To achieve the highest data quality, the instrument should be kept upright with the sensor opening facing downward to avoid water and debris accumulation. Do not obstruct the sensor opening, the sensor can operate with a partial obstruction; however, the data quality will be affected.

6 Personnel Qualification

Personnel should have basic knowledge and operational experience on the use and functionality of the PurpleAir PA-II-SD PM sensor. If no experience, then personnel will be trained either in the field or lab with this approved standard operating procedure and appropriate instrumentation. Training will be formally documented. In addition, personnel must have knowledge of general workings of laboratory and field site safety practices, including proper handling of instruments in the field. All field training activities will be specified in site specific QAPPs.

7 Equipment and Materials

Equipment:

- PurpleAir PA-II-SD PM Sensor
- PurpleAir supplied USB/AC Adaptor *(outdoor rated version)*
- PurpleAir supplied microUSB to USB power cord
- Micro to SD card adapter

- Micro SD Card(s)* (*known success with Lexar 300x 16GB microSDHC or SanDisk Ultra Class 10 UHS-I 16GB microSD Memory Card*)
- A pair of tweezers
- Laptop computer, with SD card slot and Microsoft Excel installed
- GFCI power outlet and surge-protected power strip, or weather proof power station/box (able to provide power to the sensor, contains Underwriters Laboratories (UL) listed extension cords and a UL listed surge protector). See the project QAPP or site-specific project plan for details.
- Instrument or research logbook or form

**Only one SD card is necessary for proper sensor function, however it is suggested that at least 2 be available when operating the sensor in the field.*

Materials (for field use):

- Safety Glasses
- Safety Shoes
- Work Gloves, *depending on attachment apparatus*
- Sensor attachment materials (*site specific*)

The PurpleAir sensor comes labeled with a unique device ID, an image of the sensor with the outdoor power cable is shown in Figure 1. The underside or base of the sensor (Figure 2) houses the PM inlet, microUSB connection port (for the power cable adapter), and the microSD card slot.

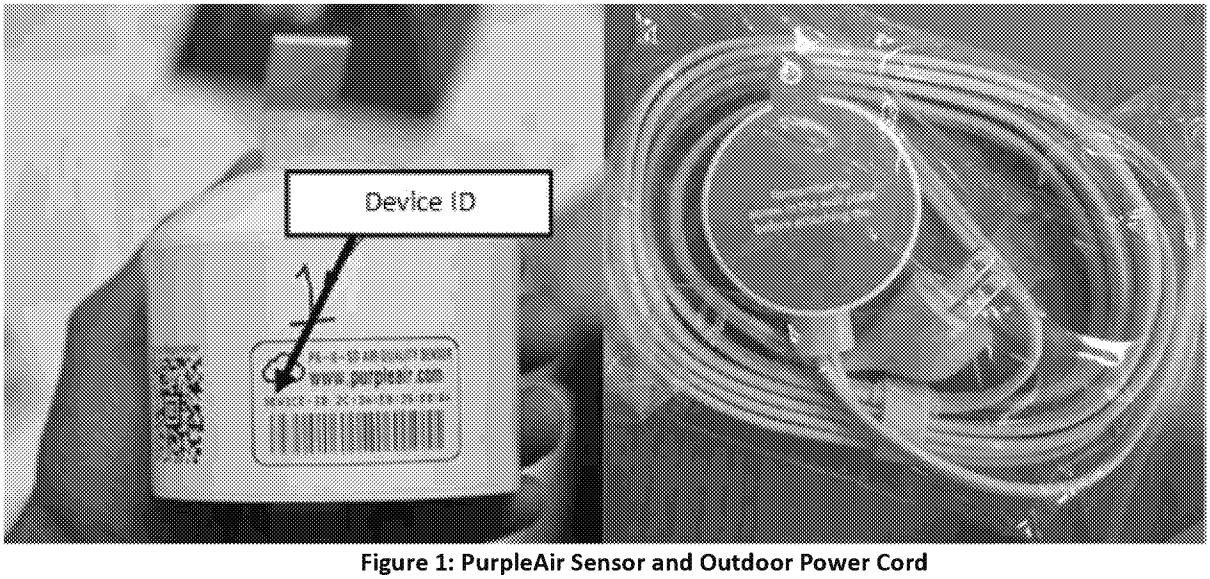


Figure 1: PurpleAir Sensor and Outdoor Power Cord

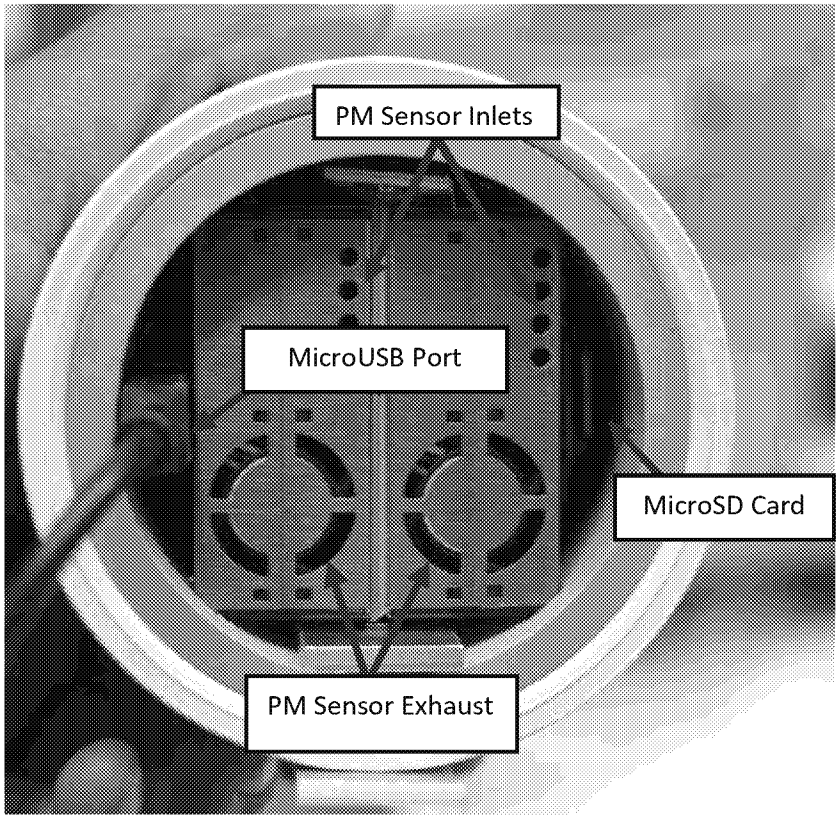


Figure 2: PurpleAir Ports (Base View)

8 Procedures

The following procedures provide for normal operation of PA-II-SD as part of an evaluation exercise.

8.1 Modifying SD Card Placement

If routine access to the microSD card is necessary, the user may wish to mount the sensors to allow for easy removal, so the sensor can be tipped onto its side to facilitate microSD card retrieval. As you can see in Figure 2, the microSD card slot is recessed into the sensor to offer greater protection from the elements. Tweezers will be needed to insert and remove the microSD card from this slot. Alternatively, at the time of ordering, you can request that PurpleAir mount the microSD card holder down toward the base of the sensor to allow easier access and they will customize the device for you. Directions to manually reposition the microSD card holder are provided below.

1. The sensor is held together using one screw on the metal plate. Removing this screw will allow the user to separate the metal plate from the white PVC cap.
2. Remove the grey PVC ring to open the sensor assembly.
3. Un-tape the microSD card holder from the side of the blue sensor, reposition and re-secure it further down.
4. Close the sensor assembly, replace the PVC ring, and reattach the metal plate to the PVC cap.

8.2 Registering the PurpleAir sensor on Purpleair.com

1. Go to: https://www.purpleair.com/register and follow the steps to register your device.

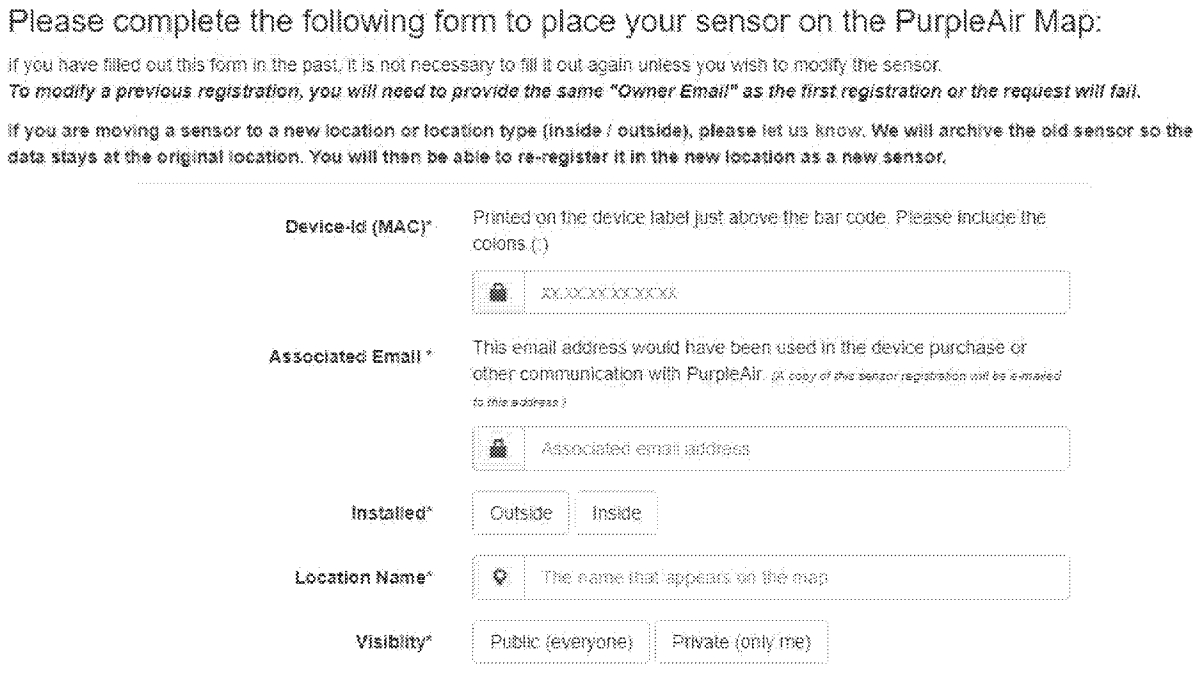


Figure 3. PurpleAir registration form

2. The Device-id (MAC) is printed on a sticker on the cap over the PurpleAir sensor (Figure 1).
3. To register the device, you must know the email address associated with the purchase. [redacted]
4. Indicate whether your device is installed outside or inside, give it a name, and decide whether you want it to be publicly available or private. *For EPA projects, the decision to operate sensors connected to the PurpleAir server and in public or private mode will be a project-specific determination specified in the project QAPP.*
5. Select a location on the map, if desired.

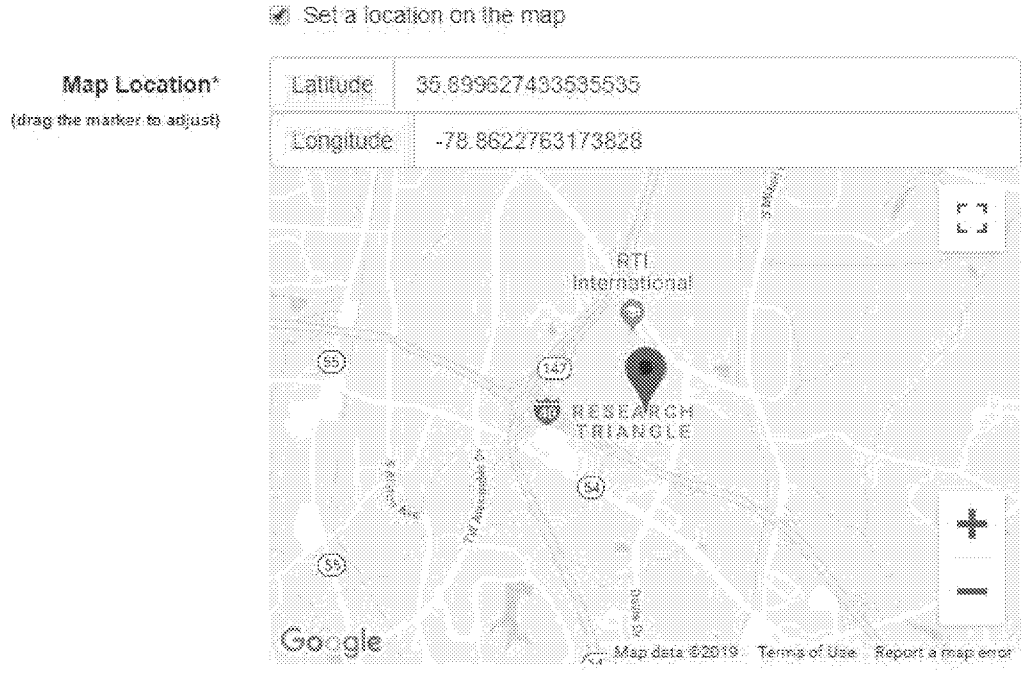


Figure 4. Setting map location during PurpleAir registration

6. Provide data to 3rd party services, if you desire.

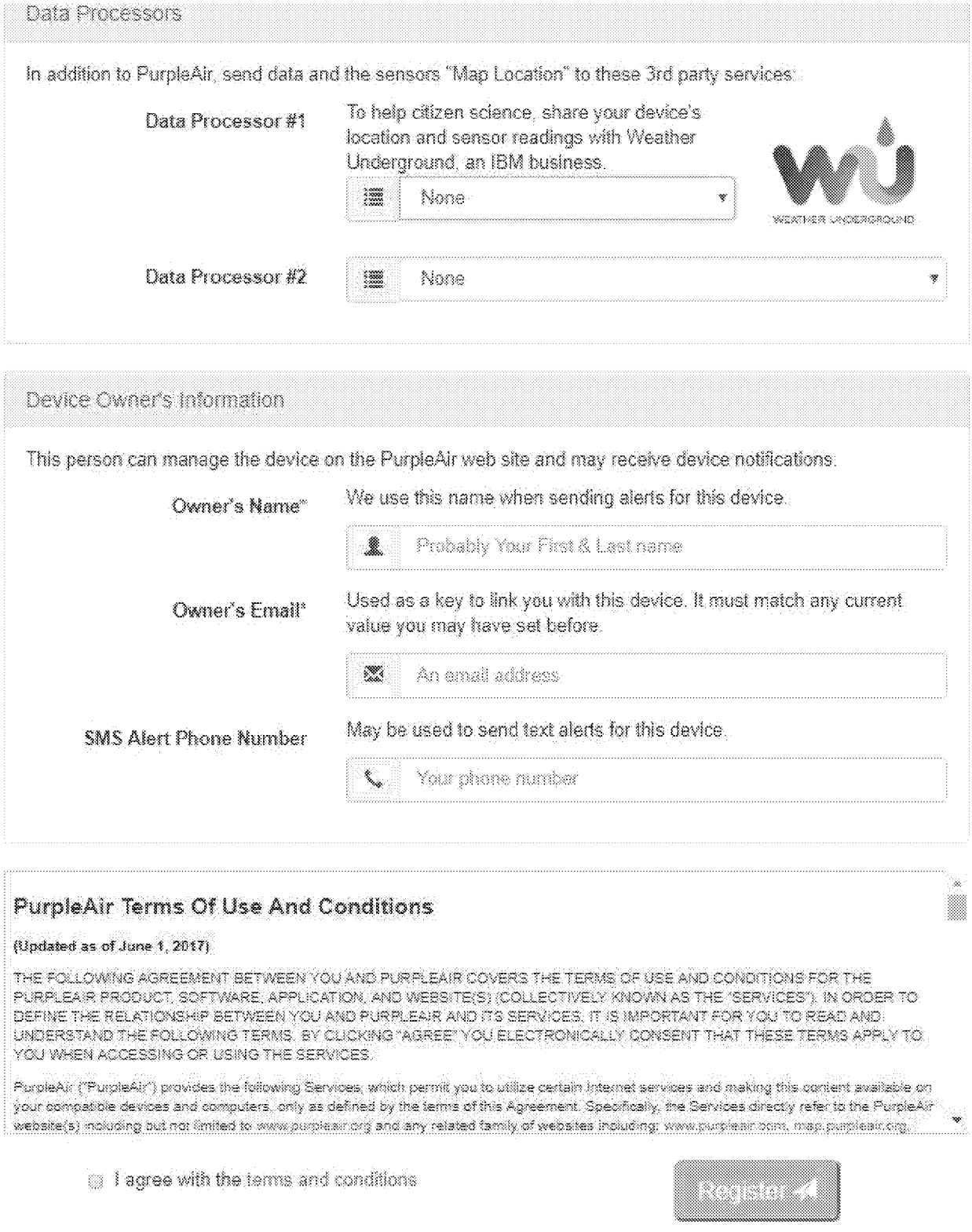


Figure 5. Final steps of PurpleAir registration form

7. If you register your device as private, **you must use a Gmail account as the owner's email** to access the data. [redacted]
8. If the device has previously been registered to a different owner's email address, you will have to contact PurpleAir to have them switch the owner email address. They request that you reply to the purchase email or the initial registration email.
9. Finally agree to the terms and conditions and register your device.

8.3 Deploying the PurpleAir

The PurpleAir's enclosure is weather proof and can be deployed out in the open or deployed inside a weather shielded shelter. The device must be installed vertically with the dome at the top, as shown in Figure 1. When installed properly, the dome will open downwards, and the sensor inlet and power port will be protected from water and debris accumulation. If sensors are deployed inside a weather shielded shelter, the structure should obstruct rain, even under high winds, but allow ambient air to pass through it for continuous ambient monitoring.

1. Invert the PurpleAir to inspect the inlets and ensure that the microSD card is properly inserted.
2. Secure the sensor to the platform apparatus (platform apparatus will be site specific and should be described in detail via site-specific QAPPs). Inspect setup to verify there aren't any obstructions blocking the sensor inlet.
3. Connect the micro-USB power cord to the outdoor AC adapter.
4. Connect the power cord to the PurpleAir.
5. Plug the AC adapter into a GFCI outlet *(this powers on the unit.)* in a manner that protects all electrical connections from water intrusion (e.g. outlet cover, weather-proof power cord connection box, or mounting inside of a shelter). See the project QAPP or site-specific project plan for details.

8.4 Connecting the PurpleAir to a WiFi Network

The PurpleAir has two methods of connection to a WiFi network, general configuration and manual configuration. Manual configuration is only necessary when trying to connect to a network with spaces or special characters in the service set identifier (SSID). At this time the PurpleAir sensors can only connect to WPA/WPA2, 2.4 GHz networks. Both WiFi configuration methods can be performed using a phone, tablet, or PC.

8.4.1 General WiFi Configuration

1. Power on the PurpleAir sensor.
2. On your network connected device, open a web browser and navigate to www.purpleair.com/configure, leave this page open for the next step.
3. On the same device, open the list of available WiFi networks and select the PurpleAir sensor signal "AirMonitor_xxxx", where "xxxx" is the last 4 digits of the sensor ID. This will disconnect your device from the WiFi network and connect it to the sensor.

4. Within 5 seconds of connection to the sensor, click "Connect to Sensor" on the configuration page from step 1 (Step 8.4.1.1). (If this connection fails, repeat steps 8.4.1.2 and 8.4.1.3.)
5. If successful, a new page will load with a list of available WiFi networks. Select your network from the list and enter the WiFi password at the bottom of the page, click "Save" to store the configuration settings.
6. Once successfully connected, the "AirMonitor_xxxx" network will disconnect from your device and disappear from the list of available networks.

8.4.2 Manual WiFi Configuration

1. Power on the PurpleAir sensor.
2. On your network connected device, open a web browser and navigate to http://192.168.4.1/config?ssid=**somename**&pass=**somepass**, where "*somename*" and "*somepass*" are your network SSID and password, respectively. Press enter to load the page, you should get a message saying that the page cannot load, this is expected. Leave this window open for the next step.
3. On the same device, open the list of available WiFi networks and select the PurpleAir sensor signal "AirMonitor_xxxx", where "xxxx" is the last 4 digits of the sensor ID. This will disconnect your device from the WiFi network and connect it to the sensor.
4. Once connected to the sensor, **quickly** refresh the browser window from step 8.4.2.2. (If this connection fails, repeat steps 8.4.2.2 and 8.4.2.3)
5. Once successfully connected, the sensor data should appear in the browser window and the "AirMonitor_xxxx" network will disconnect from your device and disappear from the list of available networks.

8.5 Starting and Stopping Data Recording

The PurpleAir sensors begin logging data as soon as they are powered on. Be sure to keep detailed notes of the time power was supplied as noted in Section 9. At power on, a green light on one side of the microSD card will blink a few times. Immediately after, the blue light on the opposite side of the microSD card will blink periodically, indicating data is being recorded. If the blue light blinks rapidly, data is likely not being recorded properly and the user should check the data file and microSD card seating. To turn off the sensor and stop data recording, disconnect it from the power strip. The sensor should always be powered off prior to removal of the SD card to prevent data corruption.

8.6 Checking the status of an online sensor

If you would like to check on the status of a PurpleAir sensor and it is either publicly available or you have access to the associated email address, you can take the following steps to check on the sensor.

1. Visit https://www.purpleair.com/map
2. Search the name of your sensor of interest in the box in the top left.
3. Once the map centers over your sensor, you can click on the sensor for a status update of the current PM levels from that PurpleAir monitor. You can compare the levels of the A and B sensors

and if they do not compare well there may be a problem with the sensor (as shown in the Figure below).

4. You can click on additional sensors and they will be added on the plot in the top left so that you can compare across sensors.

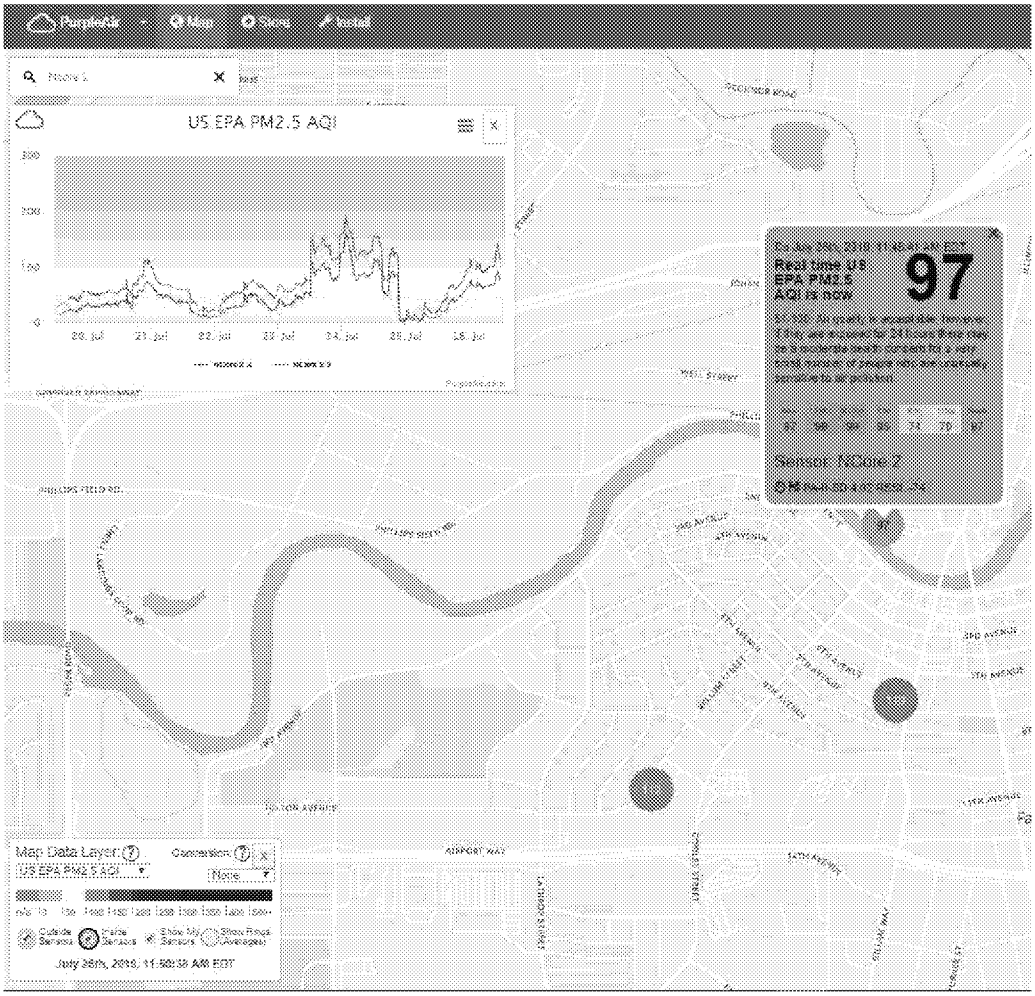


Figure 6. View from Purpleair.com/map when checking on an individual sensor.

Note: The view may be slightly different depending on the browser, plugins, and map version you are looking at (this image: from google chrome 7/26/19)

5. If the sensor is not currently reporting, you will see that here. This may indicate the sensor has lost power, WiFi, or has another problem.

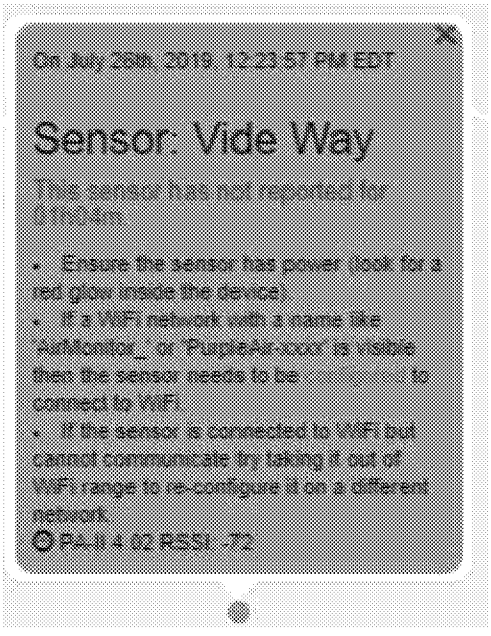


Figure 7. Example of a sensor that has gone offline.

6. Now, or next time you visit the site try restarting the sensor, completing the troubleshooting steps in the error message, and/or visiting https://www2.purpleair.com/community/faq for additional solutions.

8.7 Data Download

8.7.1 Download the data (microSD)

Follow the steps below to stop recording and download data from the device:

1. Turn the sensor off by disconnecting the power.
2. Remove the microSD card from the unit (Figure 2). Using a pair of tweezers, slightly push the microSD card inwards to release it from card docking bay, then pinch the edge of the card and pull gently to remove.
3. Insert the microSD card into an SD card adapter and insert the assembly into the Windows laptop.
4. Select and **Copy** the intended datafile(s). Sensor files are titled 'yyyymmdd.csv' and log files are titled 'yymmdd.log', where 'yyyymmdd' represents the start date. Generally, one data file and one log file will be made each day (dependent on the firmware version).
5. **Paste** the file(s) to the appropriate directory* on the laptop hard drive. *See Section 8.8 for guidelines on erasing the SD card.*
6. It is suggested data collection be verified immediately and before restarting the device. The basic initial check is provided below, further data verification instructions are provided in Section 8.6.

a. Has a data file been created for each day the sensor was deployed? If not, check for power connection issues, improper data card format, or possible improper seating of the SD card into the sensor.

7. Once all files are collected, stop the USB (SD card) device and remove from the laptop.
8. Return the microSD card to the PurpleAir sensor by reinserting the card in the docking bay and gently pressing the card with the tweezers to lock it in place. Be sure to follow the proper card orientation when re-inserting.
9. Power on the device as instructed in Section 8.4. If the blue light flashes repeatedly, the microSD card may not be properly inserted, or the data may not be recording correctly. If this happens, turn off the unit, remove, and re-insert the microSD card and restart.

**Folder directory and file naming structure are site specific determinations and should be identified in the project QAPP. For uses where multiple sensors are collocated, it is suggested that the raw file be updated to include the unit number as a unique identifier.*

8.7.2 Download the data (cloud manual)

This is the recommended download method for smaller downloads of data for PurpleAir monitors uploading data to the PurpleAir cloud via a wifi connection (online). If the PurpleAir monitor was registered in private mode, this method of data download requires that you have access to the Gmail account the PurpleAir monitor was registered with. If the monitor was registered in public mode, then the associated Gmail account is not necessary to have.

1. Go to https://www.purpleair.com/map.
2. Log into the Gmail account associated with the sensor(s) of interest if they are operating in private mode.
3. Locate the sensor on the map or by searching for the sensor name in the search bar in the top left and click on the circle representing that sensor.
4. A box describing recent measurements from the sensor will appear. After a few seconds, text will appear at the bottom of the box, including "get this widget" (Figure 8a).
5. Bring the mouse over "get this widget" and click on "download". This will open a new window to the purpleair.com/sensorlist download tool for that specific sensor.
6. Specify the start and end dates and time average you wish to download.
7. Now you can download the primary and secondary data from the A and B sensors by checking the boxes on the far left of the sensors you are interested in, then clicking "download primary/secondary (A)/(B). Make sure to download both the A and B channels by clicking their respective checkboxes (Figure 8b). Note that the downloaded PurpleAir data has a coordinated universal time (UTC) timestamp and that the time last seen is also in UTC on this page.
8. The channel labels for data downloaded manually from the PurpleAir website are reversed compared to data downloaded using the Thingspeak application programing interface (API) (section 8.7.3). The fields labeled with cf=atm in the manually downloaded data correspond to the fields labeled cf=1 in the data downloaded using API keys, and vice versa (i.e., fields labeled cf=1 in manually downloaded data correspond to fields labeled cf=atm in the API-downloaded data). This is accurate as of 11/27/19.

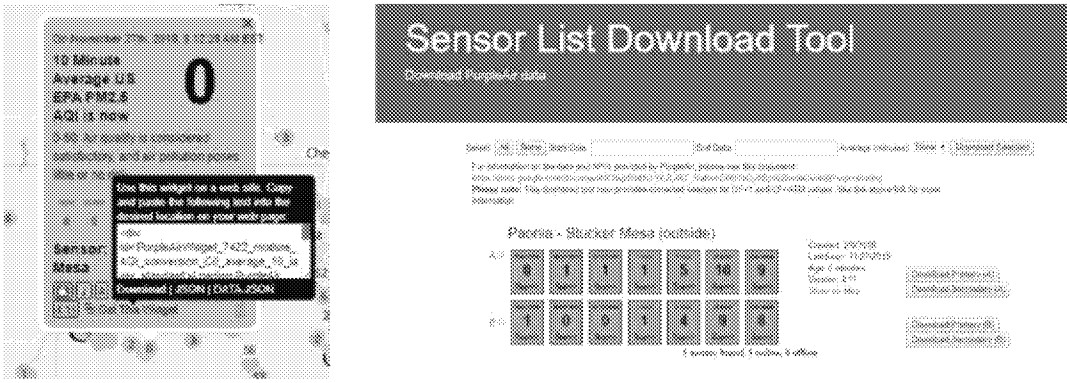


Figure 8. PurpleAir data download page.

8.7.3 Download the data (cloud automatic-with API key)

This method is preferred for automating larger data downloads or in cases where the data user does not have access to the Gmail account used to register the device.

8.7.3.1 Finding the API key and Channel number

If you do not already know the API keys, follow these steps to identify them.

1. Navigate to https://www.purpleair.com/map
2. If this is a private monitor, log into the owner google account that you used to register the monitor by using the Login button in the top right corner.
3. Locate the sensor on the map or search for the sensor name (if known). Click on the circle representing the sensor of interest.
4. Wait for "get this widget" text to appear at the bottom of the box and bring the mouse over this text. Click on the link labeled "JSON".
5. You will find 5 fields of interest for both the A and B sensors (10 total – sensor name, 2 - channel IDs, 2 - API keys). In the example below, sensor A is labeled "Paonia-Stucker Mesa" and sensor B is labeled "Paonia-Stucker Mesa B". The channel IDs are labeled "THINGSPEAK_PRIMARY_ID" and "THINGSPEAK_SECONDARY_ID" and the API keys are labeled, "THINGSPEAK_PRIMARY_ID_READ_KEY", and "THINGSPEAK_SECONDARY_ID_READ_KEY". Record the values between the quotes for all of these fields. They will be needed to access the data via the API (Section 7.8.3.2). Here's an example with these values in bold:


```
{"mapVersion":"0.3","baseVersion":"7","mapVersionString":"","results":[{"ID":
7422,"Label":"Paonia - Stucker
Mesa","DEVICE_LOCATIONTYPE":"outside","THINGSPEAK_PRIMARY_ID":"423102","THING
SPEAK_PRIMARY_ID_READ_KEY":"AJC24PSMZ6MYE80Z","THINGSPEAK_SECONDARY_ID":"4231
03","THINGSPEAK_SECONDARY_ID_READ_KEY":"MRGQDOE6IGAQGNF8","Lat":38.860887,"Lo
n":-
107.647995,"PM2_5Value":"0.0","LastSeen":1574864174,"Type":"PMS5003+PMS5003+B
ME280","Hidden":"false","DEVICE_BRIGHTNESS":"15","DEVICE_HARDWAREDISCOVERED":
"2.0+OPENLOG+15833 MB+DS3231+BME280+PMSX003-B+PMSX003-
A","Version":"4.11","LastUpdateCheck":1574862731,"Created":1518136411,"Uptime
":"1075021","RSSI":"-
67","Adc":"0.0","p_0_3_um":"108.87","p_0_5_um":"26.84","p_1_0_um":"1.57","p_2
```

```
_5_um":"0.93","p_5_0_um":"0.58","p_10_0_um":"0.41","pm1_0_cf_1":"0.0","pm2_5_
cf_1":"0.0","pm10_0_cf_1":"0.29","pm1_0_atm":"0.0","pm2_5_atm":"0.0","pm10_0_
atm":"0.29","isOwner":0,"humidity":"38","temp_f":"34","pressure":"816.2","AGE
":1,"Stats":"{\"v\":0.0,\"v1\":0.1,\"v2\":0.11,\"v3\":0.19,\"v4\":1.15,\"v5\"
:2.36,\"v6\":2.09,\"pm\":0.0,\"lastModified\":1574864174549,\"timeSinceModifi
ed\":119998}"},{"ID":7423,"ParentID":7422,"Label":"Paonia - Stucker Mesa
B","THINGSPEAK_PRIMARY_ID":"423104","THINGSPEAK_PRIMARY_ID_READ_KEY":"KWJ6KI0
WTPIFALI8","THINGSPEAK_SECONDARY_ID":"423106","THINGSPEAK_SECONDARY_ID_READ_K
EY":"SEIBD46YGMUU735V","Lat":38.860887,"Lon":-
107.647995,"PM2_5Value":"0.0","LastSeen":1574864174,"Hidden":"false","Created
":1518136411,"Adc":"0.00","p_0_3_um":"104.61","p_0_5_um":"31.06","p_1_0_um":"
1.25","p_2_5_um":"0.17","p_5_0_um":"0.0","p_10_0_um":"0.0","pm1_0_cf_1":"0.0"
,"pm2_5_cf_1":"0.0","pm10_0_cf_1":"0.0","pm1_0_atm":"0.0","pm2_5_atm":"0.0","
pm10_0_atm":"0.0","isOwner":0,"AGE":1,"Stats":"{\"v\":0.0,\"v1\":0.05,\"v2\":
0.06,\"v3\":0.12,\"v4\":0.97,\"v5\":2.12,\"v6\":1.9,\"pm\":0.0,\"lastModified
\":1574864174550,\"timeSinceModified\":119998}"}]}
```


8.7.3.2 Download from the API directly: using PowerShell

You must use a computer that has windows PowerShell to be able to download using this method.

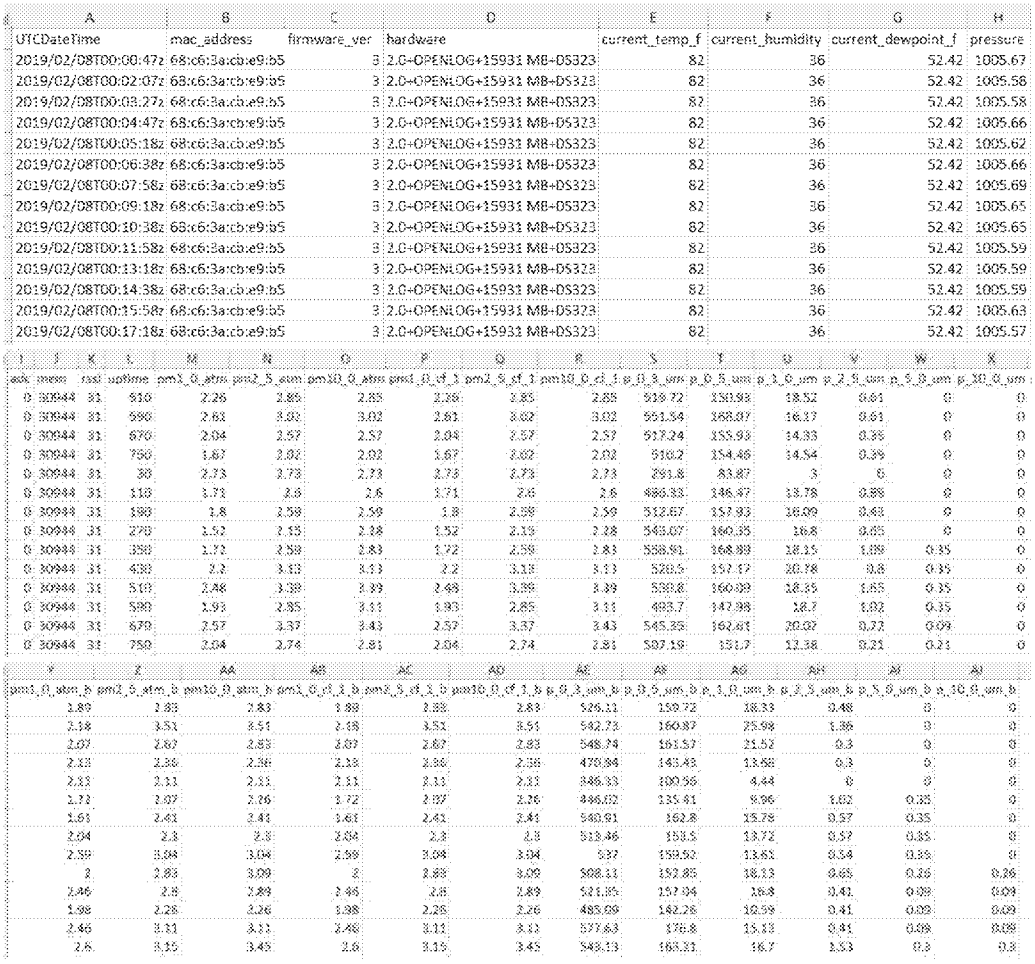
1. Locate and open the windows PowerShell app on your computer.
2. Open a blank text file in notepad
3. Copy and paste the text from section 11.4 (starting below the section title) into the blank text file.
4. You will need to update the location you would like to save data (currently: j:\temp\PA) at both the beginning and end of the document
5. Next you will need to update the table including (Reporting Organization, Channel ID, API key, Start Date). There should be 4 entries for each PurpleAir monitor assuming you want both primary and secondary data from the A and B sensors.
6. Next you will want to update the offset (currently: $offset=9) to the number of hours ahead or behind (negative) UTC is from your local standard time (LST) (e.g. 6 for central standard time (CST), 5 for eastern standard time (EST)). If you set this to zero, you will not get midnight to midnight data from the download as your first hour of data will be at 0:00 UTC.
7. Save this text file so that you can update the start dates and use again if you want to download data from these sites in the future.
8. Copy the text file and paste it into your PowerShell.
9. Press enter to run the script.
10. If this does not generate files, check your keys and try saving to a different location in case you do not have permissions to save in the initial location.

8.8 Reviewing the Data

To check data integrity, each file is imported to Microsoft Excel. The steps outlined below may differ based on the version of Excel being used. ***Please remember, raw data files ('yyyymmdd.csv' format) should NOT be altered and should be kept for the duration of any study.***

1. Open a new blank Excel workbook.
2. Under the Data tab, navigate to Get Data → From File → From Text/CSV.
3. Locate the appropriate file, select and click Import.
4. In the import wizard, select Comma and Tab from the Delimiter drop down and click load.

5. Once the data is imported it should resemble the data shown in Figures 9-12 depending on how the data was downloaded.



UTCDateTime	mac_address	firmware_ver	hardware	current_temp_f	current_humidity	current_dewpoint_f	pressure
2019/02/08T00:00:47z	68:c6:3a:cb:e9:b5	3	2.0+OPENLOG+15931	MB+DS323	82	36	52.42	1005.67
2019/02/08T00:02:07z	68:c6:3a:cb:e9:b5	3	2.0+OPENLOG+15931	MB+DS323	82	36	52.42	1005.58
2019/02/08T00:03:27z	68:c6:3a:cb:e9:b5	3	2.0+OPENLOG+15931	MB+DS323	82	36	52.42	1005.58
2019/02/08T00:04:47z	68:c6:3a:cb:e9:b5	3	2.0+OPENLOG+15931	MB+DS323	82	36	52.42	1005.66
2019/02/08T00:05:18z	68:c6:3a:cb:e9:b5	3	2.0+OPENLOG+15931	MB+DS323	82	36	52.42	1005.62
2019/02/08T00:06:38z	68:c6:3a:cb:e9:b5	3	2.0+OPENLOG+15931	MB+DS323	82	36	52.42	1005.66
2019/02/08T00:07:58z	68:c6:3a:cb:e9:b5	3	2.0+OPENLOG+15931	MB+DS323	82	36	52.42	1005.69
2019/02/08T00:09:18z	68:c6:3a:cb:e9:b5	3	2.0+OPENLOG+15931	MB+DS323	82	36	52.42	1005.65
2019/02/08T00:10:38z	68:c6:3a:cb:e9:b5	3	2.0+OPENLOG+15931	MB+DS323	82	36	52.42	1005.65
2019/02/08T00:11:58z	68:c6:3a:cb:e9:b5	3	2.0+OPENLOG+15931	MB+DS323	82	36	52.42	1005.59
2019/02/08T00:13:18z	68:c6:3a:cb:e9:b5	3	2.0+OPENLOG+15931	MB+DS323	82	36	52.42	1005.59
2019/02/08T00:14:38z	68:c6:3a:cb:e9:b5	3	2.0+OPENLOG+15931	MB+DS323	82	36	52.42	1005.59
2019/02/08T00:15:58z	68:c6:3a:cb:e9:b5	3	2.0+OPENLOG+15931	MB+DS323	82	36	52.42	1005.63
2019/02/08T00:17:18z	68:c6:3a:cb:e9:b5	3	2.0+OPENLOG+15931	MB+DS323	82	36	52.42	1005.57

J	I	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
adc	mem	rssi	uptime	pm1_0_atm	pm2_5_atm	pm10_0_atm	pm1_0_cf_1	pm2_5_cf_1	pm10_0_cf_1	p_0_3_um	p_0_5_um	p_1_0_um	p_2_5_um	p_5_0_um	p_10_0_um
0	30944	31	810	2.26	2.85	2.85	2.85	2.85	2.85	918.72	150.93	18.52	0.61	0	0
0	30944	31	590	2.61	3.01	3.02	2.81	3.02	3.02	951.54	168.07	16.17	0.61	0	0
0	30944	31	670	2.04	2.57	2.57	2.04	2.57	2.57	917.24	155.93	14.33	0.35	0	0
0	30944	31	750	1.67	2.02	2.02	1.67	2.02	2.02	910.2	154.46	14.54	0.39	0	0
0	30944	31	30	2.73	2.73	2.73	2.73	2.73	2.73	291.8	83.87	3	0	0	0
0	30944	31	110	1.71	2.6	2.6	1.71	2.6	2.6	486.83	146.47	13.78	0.86	0	0
0	30944	31	190	1.8	2.59	2.59	1.8	2.59	2.59	512.67	157.93	16.09	0.43	0	0
0	30944	31	270	1.52	2.15	2.28	1.52	2.15	2.28	543.07	160.35	16.8	0.65	0	0
0	30944	31	350	1.72	2.59	2.83	1.72	2.59	2.83	558.91	168.89	18.15	1.09	0.35	0
0	30944	31	430	2.2	3.13	3.13	2.2	3.13	3.13	520.5	157.17	20.78	0.8	0.35	0
0	30944	31	510	2.48	3.39	3.39	2.48	3.39	3.39	538.8	160.69	18.35	1.65	0.35	0
0	30944	31	590	1.93	2.85	3.11	1.93	2.85	3.11	493.7	147.98	18.7	1.02	0.35	0
0	30944	31	670	2.57	3.37	3.43	2.57	3.37	3.43	545.35	162.61	20.02	0.72	0.09	0
0	30944	31	750	2.04	2.74	2.81	2.04	2.74	2.81	587.19	151.7	12.38	0.21	0.21	0

Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ
pm1_0_atm_b	pm2_5_atm_b	pm10_0_atm_b	pm1_0_cf_1_b	pm2_5_cf_1_b	pm10_0_cf_1_b	p_0_3_um_b	p_0_5_um_b	p_1_0_um_b	p_2_5_um_b	p_5_0_um_b	p_10_0_um_b
2.89	2.83	2.83	2.89	2.83	2.83	526.11	159.72	18.33	0.48	0	0
3.18	3.51	3.51	3.18	3.51	3.51	542.73	160.87	25.98	1.36	0	0
2.07	2.87	2.83	2.07	2.87	2.83	548.74	161.57	21.52	0.3	0	0
2.33	2.36	2.36	2.33	2.36	2.36	470.84	143.43	13.68	0.3	0	0
2.33	2.33	2.33	2.33	2.33	2.33	486.33	100.56	4.44	0	0	0
1.72	2.07	2.26	1.72	2.07	2.26	486.02	135.41	9.96	1.02	0.35	0
1.61	2.41	2.41	1.61	2.41	2.41	540.91	162.8	15.78	0.57	0.35	0
2.04	2.3	2.3	2.04	2.3	2.3	513.46	153.5	13.72	0.57	0.35	0
2.59	3.04	3.04	2.59	3.04	3.04	537	159.52	13.61	0.54	0.35	0
2	2.83	3.09	2	2.83	3.09	508.11	152.85	18.33	0.65	0.35	0.26
2.46	2.8	2.89	2.46	2.8	2.89	521.85	157.04	16.8	0.41	0.09	0.09
1.98	2.26	2.26	1.98	2.26	2.26	485.09	142.26	10.59	0.41	0.09	0.09
2.46	3.11	3.11	2.46	3.11	3.11	577.63	176.8	15.13	0.41	0.09	0.09
2.6	3.15	3.45	2.6	3.15	3.45	548.13	163.31	16.7	1.53	0.3	0.3

Figure 9: Data in Excel from SD Card

	A	B	C	D	E	F	G	H	I	J	K
1	created_at	entry_id	PM1.0_CF	PM2.5_CF	PM10.0_C	UptimeMi	ADC	Temperat	Humidity	PM2.5_CF_1_ug/m3	
2	2019-07-03 00:01:51 UTC	251669	3.28	6.36	6.61	9608	-84	93	59	6.36	
3	2019-07-03 00:03:51 UTC	251670	2.94	5.08	5.48	9610	-83	93	59	5.08	
4	2019-07-03 00:05:54 UTC	251671	3.09	4.96	6.49	9612	-87	93	58	4.96	
5	2019-07-03 00:07:51 UTC	251672	2.33	5.33	5.72	9614	-82	93	58	5.33	
6	2019-07-03 00:09:53 UTC	251673	2.58	5.82	6.43	9616	-83	93	58	5.82	
7	2019-07-03 00:11:52 UTC	251674	3.03	4.87	5.49	9618	-82	92	58	4.87	
8	2019-07-03 00:13:51 UTC	251675	3.04	5.37	6.63	9620	-83	93	59	5.37	
9	2019-07-03 00:15:51 UTC	251676	2.84	5	5.83	9622	-84	92	58	5	
10	2019-07-03 00:17:51 UTC	251677	2.62	5.25	5.25	9624	-82	93	58	5.25	
11	2019-07-03 00:19:53 UTC	251678	3.06	5.74	7.27	9626	-83	92	59	5.74	
12	2019-07-03 00:21:51 UTC	251679	2.97	5.17	5.72	9628	-83	92	59	5.17	

Figure 10. Primary data file in Excel from sensor list download

	A	B	C	D	E	F	G	H	I	J	K
1	created_at	entry_id	0.3um/dl	0.5um/dl	1.0um/dl	2.5um/dl	5.0um/dl	10.0um/dl	PM1.0_CF	PM10_CF_1_ug/m3	
2	2019-07-03 00:01:52 UTC	250538	840.42	225.28	49.03	5.56	0.5	0	3.28	6.61	
3	2019-07-03 00:03:53 UTC	250539	715.41	199.58	39.19	2.81	0.38	0.38	2.94	5.48	
4	2019-07-03 00:05:55 UTC	250540	715.15	201.21	41.06	3.56	2.09	1.24	3.09	6.49	
5	2019-07-03 00:07:53 UTC	250541	676.22	179.61	46.41	3.97	0.44	0	2.33	5.72	
6	2019-07-03 00:09:55 UTC	250542	700.29	191.57	44.65	5.94	0.95	0.49	2.58	6.43	
7	2019-07-03 00:11:53 UTC	250543	722.24	197.1	43.9	2.48	1.02	0.25	3.03	5.49	
8	2019-07-03 00:13:53 UTC	250544	716.78	199.04	42.27	5.85	1.82	0.93	3.04	6.63	
9	2019-07-03 00:15:53 UTC	250545	730.08	192.33	42.97	3.12	1.47	0.12	2.84	5.83	
10	2019-07-03 00:17:52 UTC	250546	696.92	194.51	42.68	1.29	0	0	2.62	5.25	
11	2019-07-03 00:19:55 UTC	250547	723.68	202	49.19	4.61	1.87	1.1	3.06	7.27	
12	2019-07-03 00:21:55 UTC	250548	732.14	196.17	38.31	2.65	0.77	0.31	2.97	5.72	
13	2019-07-03 00:23:58 UTC	250549	716.6	201.07	50.26	4.29	1.18	0	2.76	6.47	

Figure 11. Secondary data file in Excel from Purpleair.com/sensorlist download

Note: Column A of the example data file (Figures 9-12) is the date/timestamp in UTC. Once the time field has been reformatted (Section 8.7), the time column will need to be adjusted to the local time zone (i.e. eastern standard time (EST) time is UTC-5).

6. If you are unable to open the file properly (i.e. the file is not readable):
    a. Make sure an appropriate program is being used (i.e. Microsoft Excel).
    b. Attempt to download the data again.
7. Once the data has successfully imported to Excel, verify that:
    a. The columns contain the appropriate data for the header *(as displayed in Figures 9-12)*.
    b. The first data row contains a time of either '00:00:00' representing the start of the new day or is consistent with the logging start time.
    c. The last row contains a time e.g.'23:59:59' representing the last timestamp associated with the day or is consistent with the logging stop time.
    d. The volume of data is acceptable for the operating time. While recording data for a period of 24 hours at 80 second intervals, the file should contain about 650 rows and the file size should be approximately 300KB. *Note that if the PurpleAir sensor is not connected to a network, the data stream may be periodically interrupted by several lines of text (depending on firmware version).*
    e. The mac address from the data files (Column B) matches the mac address on the device (from offline data only – see Figure 9).
8. If applicable, open the previously imported data file and ensure the date and time stamp from the last record of the file closely precedes that of the first record from the new file. If not, search for an explanation or missing data file.
9. ***If this device is being used in support of EPA-based research, send a copy of these electronic files to the appropriate EPA research lead via email or using an EPA shared drive (e.g., O:, L:) or FTP site. This can be done by copying the entire folder. The EPA will maintain a central repository of all extracted data.***

8.9 Converting the Date/Time in Excel

The following procedure can be used to separate the Date/Time column and remove the extraneous characters.

1. After importing the data to Excel, add two columns to the left of Column A.

2. Remove the "UTCDateTime" header (now Column C), otherwise the next step will not work properly.
3. Select the entire UTCDateTime column.
4. Under the Data tab, select Text to Columns.
5. In the wizard, select Delimited and click next.
6. Select Other, put the letter T in the box and click next.
7. Select General and under Destination highlight cell A1, then click finish. The date and time should now be in two columns (A & B) and the date column should now be in the proper MM/DD/YYYY format.
8. Next, select the new time column.
9. Under the Home tab, select Find & Select→ Replace.
10. Under Find, enter z. Leave the Replace field blank and select Replace All. The time column should now be in the HH:MM:SS format. Steps 11-13 instruct on how to round the time field to the nearest minute, as may be required by some analysis tools.
11. Insert a column to the right of the new time column and add a header (i.e. Adjusted Time).
12. In the first cell under the header insert the equation "=MROUND(CELL#,0:01)", where cell is the first cell in the time column and "0:01" is the multiple. Copy the formula down the rest of the column.
13. Highlight the adjusted time column. Under the Formats dropdown, select More Formats>Time and select desired time format.

8.10 Deleting Existing Data

While it is good practice to remove existing data stored prior to the current data collection activity, it is not required in this case as the files are named sequentially. Typically, the microSD Card can hold several months of 1-minute data before getting filled. Data can be deleted as necessary to complete field measurements.

9 Data and Records Management

Records should be made during sensor deployment, start-up, shut-down and data transfer. Field notes including observations about nearby or transient pollution sources, weather, and/or instrument operation may be useful in interpreting the sensor data. All such records should be kept using an EPA research or field notebook or form in archival quality black ink and should be marked with the project QAPP ID, location, device ID, date and time or visit and/or data transfer, and observer's name and signature. Any co-observers should also be recorded. A hard-copy of these notes should be maintained for the lifetime of the project, and if collected in support of an EPA research project, must be provided to the EPA research lead. An electronic research notebook may also be used in addition to or in place of a paper research notebook.

Raw data files will not contain any edits performed by Staff. Any files that contain any analysis will be saved onto the EPA shared drive using a different name and all analysis will be recorded into the research notebook (hard-copy or approved electronic format). The analysis consists of, but not limited to: graphs, statistical tests, notes, conclusions, etc. Any non-handwritten notes will be attached to the lab notebook page and the author will sign and date the edge. Notebook record entries will be reviewed by other members of the team and then an employee outside of the team.

Quality control and assurance work, file concatenation, and data evaluation will all start with the raw data collected by the sensor. ***If this device is being used in support of EPA-based research, a copy of the complete and verified data file for each sensor and the research notebook should be provided to the EPA research lead.***

10 Quality Assurance/Quality Control

This SOP is intended ONLY to explain the basic operating procedures of the device such as instrument power-on and power-off procedures, data collection, and data recovery. Project specific QC and QA procedures for the data produced should be developed independently and followed. At a minimum, the recovered data files will be reviewed to look for data gaps and deviations from the expected data files structure (missing lines, columns, or cells within the data file). Unexplained data gaps and deviations will be investigated and troubleshooting procedures implemented, where possible. All efforts should be recorded in the research notebook (see Section 9). As necessary, this SOP will be updated to try to eliminate future data loss.

11 Resources

The following resources may be helpful. Some resources may be restricted to EPA personnel or project partners.

[redacted]

11.2 PurpleAir documents

Using PurpleAir Data Page:
https://docs.google.com/document/d/15ijz94dXJYAZLi9iZ_RaBwrZ4KtYeCy08goGBwnbCU/edit#

11.3 PurpleAir FAQs website:

https://www2.purpleair.com/community/faq

11.4 PowerShell script for API data download

```
#This code was written by Sean Fitzsimmons, Iowa Department of Natural Resources
#Modified by Karoline Johnson 7/12/19

# create PA directory if it doesn't already exist
#You may need to change the directory you write to depending on the security settings on your computer
#External devices (flash drive) may be easier
#This example assumes you are writing to a drive j but update for the drive of your flash drive or other
        desired location.
#Here's an additional example if you have access to your c drive:
#md -Force c:\temp\PA | Out-Null

md -Force j:\temp\PA | Out-Null
<#
Uncomment the next line to delete all files in the home directory to clean up between runs;
all the old files must be closed, or the script will hang
#>

#ENTER API KEYS, ETC. HERE!
# You will need to update all these below with your sensor names, channel IDs, API key, and start dates.
# The format used in the rows below is: (Sensor name, Channel ID, API key, Start Date)
#See the example below for open source data from Alaska
$IowaPA=@(
("Ncore","599388","ZQ08WBD0RP32MSHP","7/12/2019"),
("Ncore","599389","7FYHQD0VW1N59PTH","7/12/2019"),
("Ncore B","599390","E81YTMI867007UN8","7/12/2019"),
("Ncore B","599391","VI8KUWBWT3IEL6V6","7/12/2019"),
("NCore 2","583465","DVES8U6IXYSV2SG0","7/12/2019"),
("NCore 2","583466","CUXEI571Q1EXR2WW","7/12/2019"),
("Ncore 2 B","583467","HP1Y8XE12UPBFGBS","7/12/2019"),
("Ncore 2 B","583468","KZS7G5IOTWDP8FJZ","7/12/2019"),
("Ncore 3","666006","H6JBLR24DNECCR5L","7/12/2019"),
("Ncore 3","666007","YUCUSAG739TI7BID","7/12/2019"),
("Ncore 3 B","666008","HTSVHH26TSR8NUX2","7/12/2019"),
("Ncore 3 B","666009","QLE7S8Y2FHTGYMKL","7/12/2019"))

$NumberOfChannels=$IowaPA.Count
```

```
For ($i=0; $i -lt $NumberOfChannels; $i++) {

$channels=$IowaPA[$i][1]
$api_key=$IowaPA[$i][2]
$startdate=$IowaPA[$i][3]

$mylabel=$IowaPA[$i][0] +"-"+ $IowaPA[$i][1]

#create output file that includes the time the script was run

$outfile="J:\temp\PA"+ $mylabel + "_" + $(get-date -f MM_dd_yy_hh_mm_ss) + ".csv"

#write the identifying information for the channel to the screen

echo($mylabel)

#build strings for api query

$url="https://api.thingspeak.com"

# Create variables for start and end dates for query loop

<#
Purple air stores data with a UTC timestamp. EPA monitors have an LST timestamp,
So to compare data sets we will ultimately want to convert the PA timestamps to LST in a spreadsheet.
In this script we download the UTC PA data corresponding to LST days.
Examples:
UTC is six hours ahead of LST(Central Standard Time) in Iowa.
UTC is 9 hours ahead of LST(Alaska Standard Time) in Alaska
Note if you miss this step it won't impact your data quality
you will just be missing a few hours of your daily average
#>
#EDIT THIS OFFSET FOR YOUR TIME ZONE!
$offset=9

# Use the channel's start date (coverted to UTC) for the first day to query

$startloopLST=Get-Date $startdate
$startloop=$startloopLST.AddHours($offset)

#use current date-time (converted to UTC) as the last day to query
```

```
$now=Get-Date
$nowUTC=$now.ToUniversalTime()
$endloop=$nowUTC

# Make start and end dates for the query of the first day's data and make strings

$start=$startloop
$end=$start.AddDays(0).AddHours(23).AddMinutes(59).AddSeconds(59)
$startstring= $start.tostring("yyyy-MM-dd"+"T"+"HH:mm:ss"+"Z")
$endstring=$end.tostring("yyyy-MM-dd"+"T"+"HH:mm:ss"+"Z")

#Create query for header; we dont need any data, so the start and end dates are the same.

$query=$url+"/channels/"+$channels+"/"+"feed.xml?"+"api_key="+$api_key+"&start="+$startstring+"&en
        d="+$startstring

# run api query, store results in variable $xml

$xml = Invoke-RestMethod -Uri $query -Method Get -TimeoutSec 300;

# make the header from the xml

$header=('monitor-id','channel-id', 'created-at', 'entry-id', $xml.channel.field1, $xml.channel.field2,
        $xml.channel.field3,
        $xml.channel.field4,$xml.channel.field5,$xml.channel.field6,$xml.channel.field7,$xml.channel.field
        8)

# write header to outfile; we will append each days data to this file.

$header-join ", "> $outfile

# Loop, querying one day at a time and appending to outfile until final day for the query is reached

Do
{

$query=$url+"/channels/"+$channels+"/"+"feed.xml?"+"api_key="+$api_key+"&start="+$startstring+"&en
        d="+$endstring

echo( $start.tostring("MM-dd-yy"))

$xml = Invoke-RestMethod -Uri $query -Method Get -TimeoutSec 300;
```

```
$nodes=$xml.channel.feeds.feed

#extract each row of data in the days data from the array "nodes" and put it in "array".

foreach ($node in $nodes){

# Extract the first row of data from the xml and append to the channel output file

$array= ($xml.channel.name, $xml.channel.ID.'#text', $node.'created-at'.'#text',$node.'entry-
        id'.'#text',$node.field1,$node.field2,$node.field3,$node.field4,$node.field5,$node.field6,$node.fiel
        d7,$node.field8)
$array-join ", ">> $outfile
}

# create start and end dates for next days query

$start=$start.AddDays(1)
$end=$start.AddDays(0).AddHours(23).AddMinutes(59).AddSeconds(59)
$startstring= $start.tostring("yyyy-MM-dd"+"T"+"HH:mm:ss"+"Z")
$endstring=$end.tostring("yyyy-MM-dd"+"T"+"HH:mm:ss"+"Z")

# loop while the next day to query day is less than last day of the query.

}While ($start-lt $endloop)
}
```

Manifest for Grant Application # GRANT13580212

Grant Application XML file (total 1):

1. GrantApplication.xml. (size 29393 bytes)

Forms Included in Zip File(total 6):

1. Form ProjectNarrativeAttachments_1_2-V1.2.pdf (size 16043 bytes)

2. Form SF424_3_0-V3.0.pdf (size 24097 bytes)

3. Form SF424A-V1.0.pdf (size 23390 bytes)

4. Form EPA4700_4_3_0-V3.0.pdf (size 22583 bytes)

5. Form OtherNarrativeAttachments_1_2-V1.2.pdf (size 15988 bytes)

6. Form EPA_KeyContacts_2_0-V2.0.pdf (size 37266 bytes)

Attachments Included in Zip File (total 10):

1. ProjectNarrativeAttachments_1_2 ProjectNarrativeAttachments_1_2-Attachments-1241-Combined_Letters032422.pdf application/pdf (size 5975205 bytes)

2. OtherNarrativeAttachments_1_2 OtherNarrativeAttachments_1_2-Attachments-1234-Mandatory_Attachments.pdf application/pdf (size 1808358 bytes)

3. ProjectNarrativeAttachments_1_2 ProjectNarrativeAttachments_1_2-Attachments-1242-Biosketches_Combined032522.pdf application/pdf (size 582838 bytes)

4. ProjectNarrativeAttachments_1_2 ProjectNarrativeAttachments_1_2-Attachments-1239-QA_QC_Plan_Final.pdf application/pdf (size 108033 bytes)

5. ProjectNarrativeAttachments_1_2 ProjectNarrativeAttachments_1_2-Attachments-1240-QA_Appendix_UORV PA-II SOP.pdf application/pdf (size 1634002 bytes)

6. ProjectNarrativeAttachments_1_2 ProjectNarrativeAttachments_1_2-Attachments-1238-Upper Ohio River Monitoring Grant_0322522_final.pdf application/pdf (size 387521 bytes)

7. ProjectNarrativeAttachments_1_2 ProjectNarrativeAttachments_1_2-Attachments-1243-EJ_Screen_Appendix_Full.pdf application/pdf (size 6382384 bytes)

8. OtherNarrativeAttachments_1_2 OtherNarrativeAttachments_1_2-Attachments-1235-Combined_Letters032422.pdf application/pdf (size 5975205 bytes)

9. OtherNarrativeAttachments_1_2 OtherNarrativeAttachments_1_2-Attachments-1236-Biosketches_Combined032522.pdf application/pdf (size 582838 bytes)

10. OtherNarrativeAttachments_1_2 OtherNarrativeAttachments_1_2-Attachments-1237-EJ_Screen_Appendix_Full.pdf application/pdf (size 6382384 bytes)

QA/QC Plan

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DATA QUALITY

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Our approach to data quality begins before a monitor generates the first byte of data. Careful monitor placement is important in avoiding data issues later during data analysis. We follow a number of guidelines in selecting hosts for any monitor we place. We avoid placing monitors with hosts who are smokers. Since we are not investigating the impact of wood burning on EJ communities we avoid placing monitors in close proximity to sites where wood is used for home heating or frequent fireplace use. This means not only the individual host but also near neighbors. Once we've identified an appropriate host site we must then avoid placement at the site near kitchen, laundry or heating vents. Finally, because in most cases we are using monitors that upload data continuously to the cloud, the monitor placement must be such that a reasonably strong wifi signal is available.

Once a monitor is placed and data collection has begun additional data quality assurance methods are brought to bear. There are generic guidelines that apply to any monitor and there are methods that are specific to a particular type of monitor. The project will be using a data console developed by the Environmental Health Project named AirView. To aid in rapid identification of anomalous data drop-out conditions, AirView will automatically alert the project Quality Assurance Manager, when low-cost monitors are offline for more than 12 hours. AirView also conducts automated quality control by removing readings that are outside the specified operating range of the sensor in use. In addition AirView returns standalone relative humidity data to aid in determining whether a spike in monitor readings is due to rapid weather changes, which can affect a wide array of sensors. Finally AirView can present information about atmospheric stability to help determine if pollutant readings are being exacerbated by weather conditions.

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Data from the continuous monitors will be uploaded to a server that the Environmental Health Project maintains to serve data through AirView. Data from episodic analytical testing are stored locally on project computer hard drives. Contractors conducting measurements are responsible for verifying that data are stored in the appropriate locations and that the cloud drives are available to all project personnel.

Internal Revenue Service

Department of the Treasury
P. O. Box 2508
Cincinnati, OH 45201

Date: April 6, 2006

COMMUNITY FOUNDATION OF GREATER
JOHNSTOWN
% MICHAEL KANE
116 MARKET ST STE 4
JOHNSTOWN PA 15901-1644

Person to Contact:
Ms. Dalton 31-07967
Customer Service Specialist
Toll Free Telephone Number:
877-829-5500
Federal Identification Number:
25-1637373

Dear Sir or Madam:

This is in response to your request of April 6, 2006, regarding your organization's tax-exempt status.

In January 1991 we issued a determination letter that recognized your organization as exempt from federal income tax. Our records indicate that your organization is currently exempt under section 501(c)(3) of the Internal Revenue Code.

Our records indicate that your organization is also classified as a public charity under sections 509(a)(1) and 170(b)(1)(A)(vi) of the Internal Revenue Code.

Our records indicate that contributions to your organization are deductible under section 170 of the Code, and that you are qualified to receive tax deductible bequests, devises, transfers or gifts under section 2055, 2106 or 2522 of the Internal Revenue Code.

If you have any questions, please call us at the telephone number shown in the heading of this letter.

Sincerely,

Janna K. Skufca

Janna K. Skufca, Director, TE/GE
Customer Account Services

INTERNAL REVENUE SERVICE
DISTRICT DIRECTOR
P. O. BOX 2508
CINCINNATI, OH 45201

DEPARTMENT OF THE TREASURY

Date: MAR 05 1998

Employer Identification Number:
25-1637373
DLN:
318050081
Contact Person:
D. A. DOWNING
Contact Telephone Number:
(513) 241-5199
Addendum Applies:
Yes

THE COMMUNITY FOUNDATION OF GREATER JOHNSTOWN
216 FRANKLIN STREET SUITE 606
JOHNSTOWN, PA 15901

Dear Applicant:

Based on the information you recently submitted, we have classified your organization as one that is not a private foundation within the meaning of section 509(a) of the Internal Revenue Code because you are described in section 509(a)(2).

Your exempt status under section 501(a) of the Internal Revenue Code as an organization described in 501(c)(3) is still in effect.

This classification is based on the assumption that your operations will continue as you have stated. If your sources of support, or your purposes, character, or method of operation change, please let us know so we can consider the effect of the change on your exempt status and foundation status.

This supersedes our letter dated ** see addendum.

Grantors and contributors may rely on this determination unless the Internal Revenue Service publishes notice to the contrary. However, if you lose your section 509(a)(2) status, a grantor or contributor may not rely on this determination if he or she was in part responsible for, or was aware of, the act or failure to act, or the substantial or material change on the part of the organization that resulted in your loss of such status, or if he or she acquired knowledge that the Internal Revenue Service had given notice that you would no longer be classified as a section 509(a)(2) organization.

If we have indicated in the heading of this letter that an addendum applies, the addendum enclosed is an integral part of this letter.

Because this letter could help resolve any questions about your private foundation status, you should keep it in your permanent records.

Letter 1078 (DO/CG)

THE COMMUNITY FOUNDATION OF GREATER

If you have any questions, please contact the person whose name and telephone number are shown above.

Sincerely yours,

Contract Director

Enclosure:
Addendum

Letter 1078 (DO/CG)

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Monitoring Chronic and Acute Pollution in the Upper Ohio River Valley Project

Standard Operating Procedure
Purple Air PA-II and PA-II SD Monitors

Effective date 9/1/2022

SOP Reviewed and Approved

Quality Assurance Manager

3/24/2022

This SOP was adapted from a draft SOP developed by US EPA Office of Research and Development

TABLE OF CONTENTS

Figures

Purple Air PA-II-SD Standard Operating Procedure

1 Scope and Applicability

This standard operating procedure (SOP) describes the procedures for operating and recovering data from the PurpleAir (PurpleAir LLC) PA-II-SD particulate matter (PM) sensor. In this SOP, instructions are provided for deployment, startup, wireless connection, operational verification, data download and data import into Microsoft Excel. Data from the PurpleAir sensors can be compared with collocated reference grade monitors to evaluate accuracy, precision, and bias of the sensor measurements relative to the reference concentrations, as well as variability in the response between the sensors. The Purple Air Sensor can be used for a variety of applications including ambient monitoring and research, indoor air quality investigations, atmospheric and climate research, and health studies.

2 Background

The PurpleAir sensor will collect data at an ambient air quality monitoring site. The PurpleAir PA-II-SD uses a PMS5003 laser particle counter to report concentrations of PM_1, $PM_{2.5}$, and PM_{10} ($\mu g/m^3$) along with particle counts in several size bins (<0.3µm, <0.5µm, <1µm, <2.5µm, <5µm, and <10µm) as well as temperature (T), relative humidity (RH), and pressure (P). PM is detected via laser scattering with an effective range of 0-500 $\mu g/m^3$, a maximum range of 1000 $\mu g/m^3$, with a counting efficiency of 50% at 0.3 µm and 98% for >=0.5 µm. The operable temperature range is between -20 and 60 ◦C, with a RH range of 0-99% and a pressure of 300-1100 hPa. The PurpleAir records data at a 2-minute (as of firmware versions 4.02 or later, updated across devices on 5/31/19) averaging interval on an internal microSD (Secure Digital) card up to 64 GB. Previous firmware recorded data at 80-second intervals so historic data was logged at this rate and any devices that have not been updated to the current firmware version will as well.

3 Definitions/Acronyms

µm	micrometer
°C	degree(s) Celsius
AC	Alternating Current
CHP	Chemical Hygiene Plan
EPA	U.S. Environmental Protection Agency
GFCI	Ground Fault Circuit Interrupter
Ghz	Gigahertz
hPa	Hectopascals
P	pressure
PPE	Personal protective equipment
PM	Particulate Matter
PM_1	particulate matter with diameters < 1 µm
$PM_{2.5}$	particulate matter with diameters < 2.5 µm
PM_{10}	particulate matter with diameters < 10 µm
PVC	Polyvinyl chloride

RH	Relative Humidity
SD Card	Secure Digital Card
SSID	Service set identifier
T	Temperature
UL	Underwriters Laboratories
USB	Universal Serial Bus
UTC	Coordinated Universal time
WACOR	work assignment contracting officer's representative
WAL	work assignment leader
WiFi	Wireless Fidelity

4 Health and Safety

Standard laboratory PPE should be worn at all times during the operation of the PurpleAir sensors in the lab, in accordance with the U.S. Environmental Protection Agency (EPA) CHP. During outdoor deployment, site-specific safety protocols and procedures should be followed. Additionally, due to the inevitable exposure of the PurpleAir to inclement weather, ensure that all electrical connections are made in a manner that protects all electrical connections from water intrusion.

5 Cautions/Interferences

As outlined in sections 8.2-8.5, to mitigate the risk of data loss all directions to power on and power off the unit must be strictly followed. Improper powering procedures could cause data corruption and sensor damage. As with any air monitoring instrumentation, certain precautions should be taken in the installation of the equipment. To achieve the highest data quality, the instrument should be kept upright with the sensor opening facing downward to avoid water and debris accumulation. Do not obstruct the sensor opening, the sensor can operate with a partial obstruction; however, the data quality will be affected.

6 Personnel Qualification

Personnel should have basic knowledge and operational experience on the use and functionality of the PurpleAir PA-II-SD PM sensor. If no experience, then personnel will be trained either in the field or lab with this approved standard operating procedure and appropriate instrumentation. Training will be formally documented. In addition, personnel must have knowledge of general workings of laboratory and field site safety practices, including proper handling of instruments in the field. All field training activities will be specified in site specific QAPPs.

7 Equipment and Materials

Equipment:

- PurpleAir PA-II-SD PM Sensor
- PurpleAir supplied USB/AC Adaptor *(outdoor rated version)*
- PurpleAir supplied microUSB to USB power cord
- Micro to SD card adapter

- Micro SD Card(s)* (*known success with Lexar 300x 16GB microSDHC or SanDisk Ultra Class 10 UHS-I 16GB microSD Memory Card*)
- A pair of tweezers
- Laptop computer, with SD card slot and Microsoft Excel installed
- GFCI power outlet and surge-protected power strip, or weather proof power station/box (able to provide power to the sensor, contains Underwriters Laboratories (UL) listed extension cords and a UL listed surge protector). See the project QAPP or site-specific project plan for details.
- Instrument or research logbook or form

**Only one SD card is necessary for proper sensor function, however it is suggested that at least 2 be available when operating the sensor in the field.*

Materials (for field use):

- Safety Glasses
- Safety Shoes
- Work Gloves, *depending on attachment apparatus*
- Sensor attachment materials (*site specific*)

The PurpleAir sensor comes labeled with a unique device ID, an image of the sensor with the outdoor power cable is shown in Figure 1. The underside or base of the sensor (Figure 2) houses the PM inlet, microUSB connection port (for the power cable adapter), and the microSD card slot.

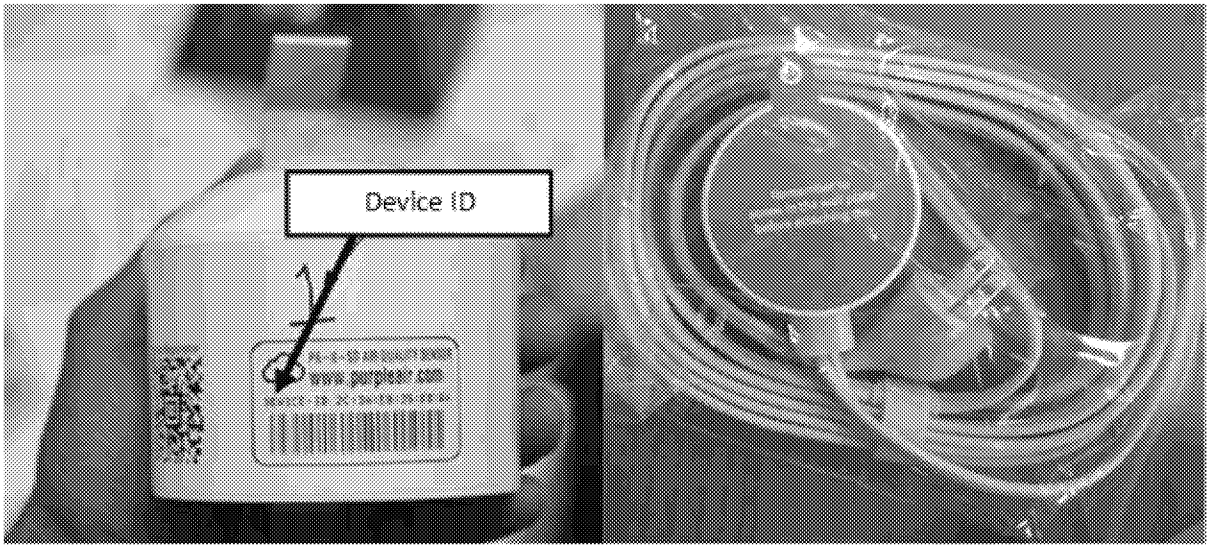


Figure 1: PurpleAir Sensor and Outdoor Power Cord

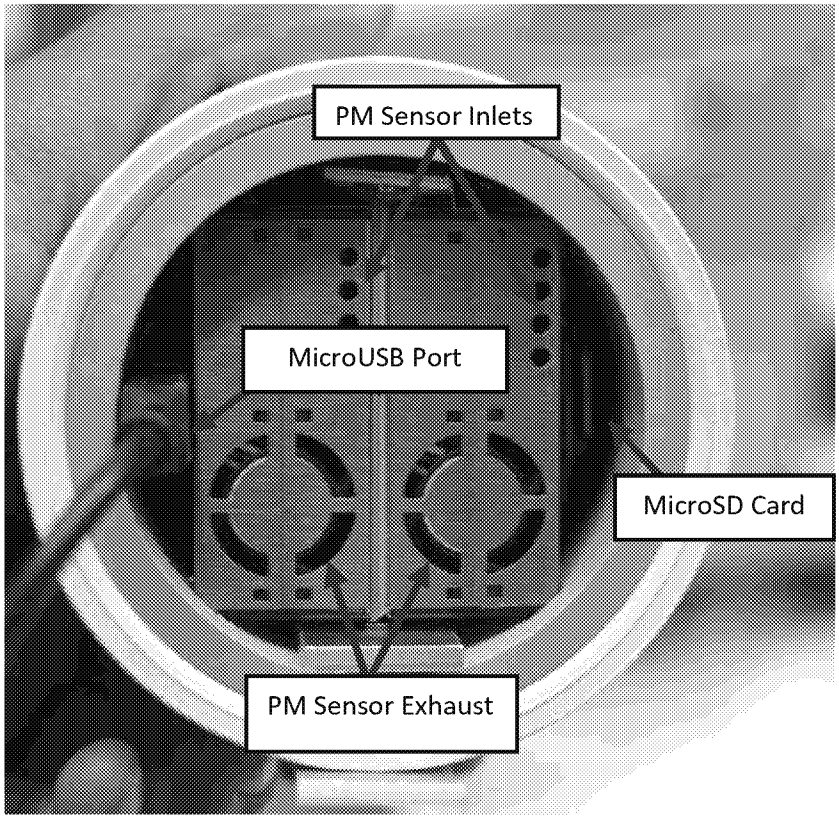


Figure 2: PurpleAir Ports (Base View)

8 Procedures

The following procedures provide for normal operation of PA-II-SD as part of an evaluation exercise.

8.1 Modifying SD Card Placement

If routine access to the microSD card is necessary, the user may wish to mount the sensors to allow for easy removal, so the sensor can be tipped onto its side to facilitate microSD card retrieval. As you can see in Figure 2, the microSD card slot is recessed into the sensor to offer greater protection from the elements. Tweezers will be needed to insert and remove the microSD card from this slot. Alternatively, at the time of ordering, you can request that PurpleAir mount the microSD card holder down toward the base of the sensor to allow easier access and they will customize the device for you. Directions to manually reposition the microSD card holder are provided below.

1. The sensor is held together using one screw on the metal plate. Removing this screw will allow the user to separate the metal plate from the white PVC cap.
2. Remove the grey PVC ring to open the sensor assembly.
3. Un-tape the microSD card holder from the side of the blue sensor, reposition and re-secure it further down.
4. Close the sensor assembly, replace the PVC ring, and reattach the metal plate to the PVC cap.

8.2 Registering the PurpleAir sensor on Purpleair.com

1. Go to: https://www.purpleair.com/register and follow the steps to register your device.

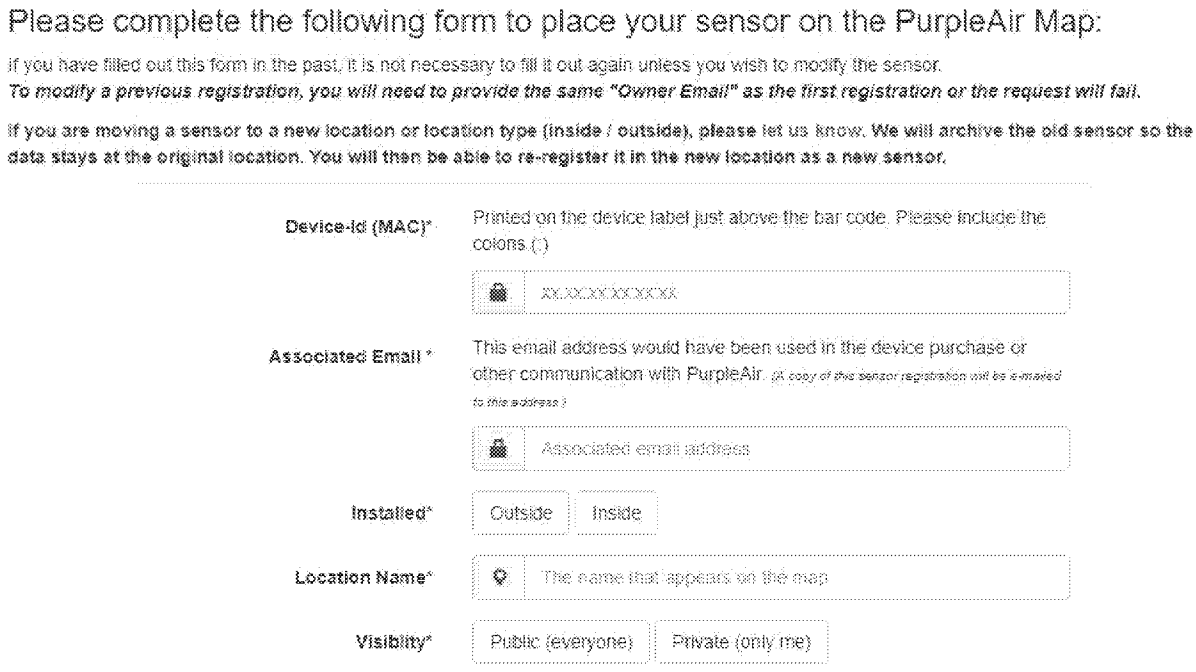


Figure 3. PurpleAir registration form

2. The Device-id (MAC) is printed on a sticker on the cap over the PurpleAir sensor (Figure 1).
3. To register the device, you must know the email address associated with the purchase. [redacted]
4. Indicate whether your device is installed outside or inside, give it a name, and decide whether you want it to be publicly available or private. *For EPA projects, the decision to operate sensors connected to the PurpleAir server and in public or private mode will be a project-specific determination specified in the project QAPP.*
5. Select a location on the map, if desired.

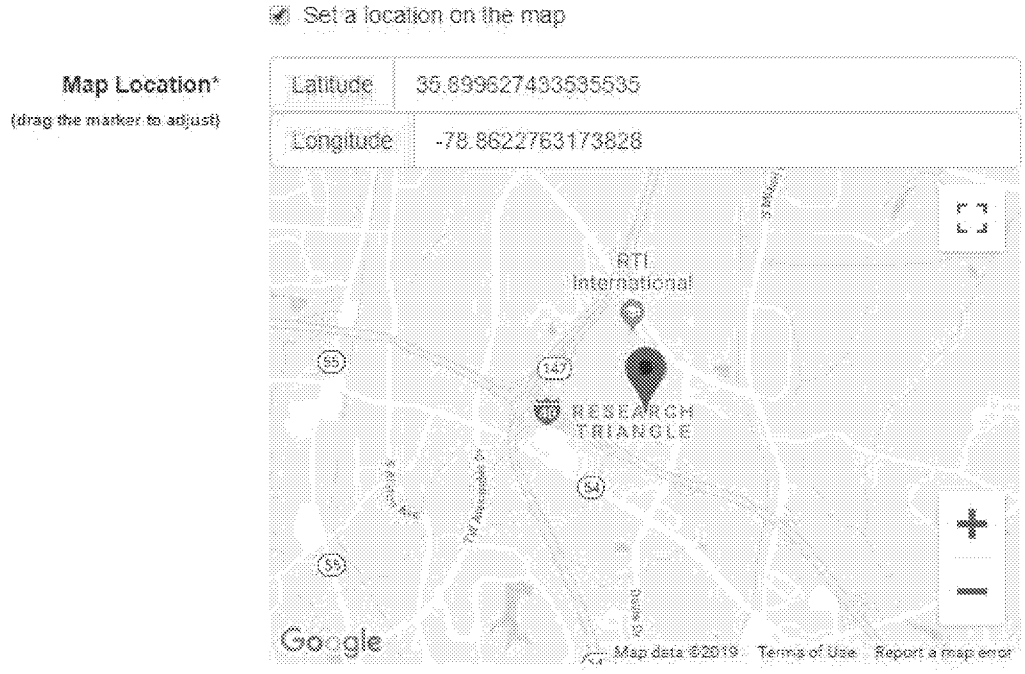


Figure 4. Setting map location during PurpleAir registration

6. Provide data to 3rd party services, if you desire.

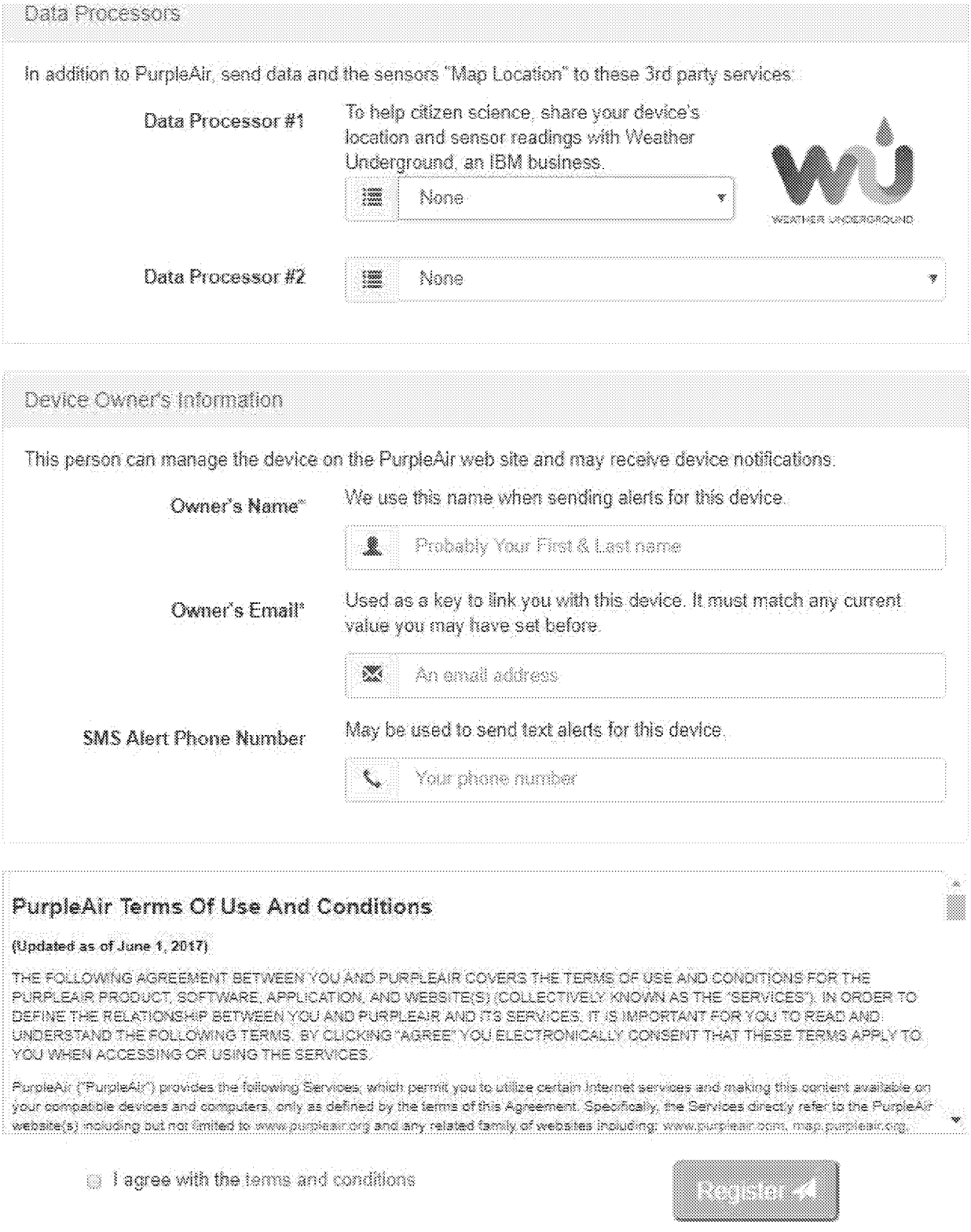


Figure 5. Final steps of PurpleAir registration form

7. If you register your device as private, **you must use a Gmail account as the owner's email** to access the data. [redacted]
8. If the device has previously been registered to a different owner's email address, you will have to contact PurpleAir to have them switch the owner email address. They request that you reply to the purchase email or the initial registration email.
9. Finally agree to the terms and conditions and register your device.

8.3 Deploying the PurpleAir

The PurpleAir's enclosure is weather proof and can be deployed out in the open or deployed inside a weather shielded shelter. The device must be installed vertically with the dome at the top, as shown in Figure 1. When installed properly, the dome will open downwards, and the sensor inlet and power port will be protected from water and debris accumulation. If sensors are deployed inside a weather shielded shelter, the structure should obstruct rain, even under high winds, but allow ambient air to pass through it for continuous ambient monitoring.

1. Invert the PurpleAir to inspect the inlets and ensure that the microSD card is properly inserted.
2. Secure the sensor to the platform apparatus (platform apparatus will be site specific and should be described in detail via site-specific QAPPs). Inspect setup to verify there aren't any obstructions blocking the sensor inlet.
3. Connect the micro-USB power cord to the outdoor AC adapter.
4. Connect the power cord to the PurpleAir.
5. Plug the AC adapter into a GFCI outlet *(this powers on the unit.)* in a manner that protects all electrical connections from water intrusion (e.g. outlet cover, weather-proof power cord connection box, or mounting inside of a shelter). See the project QAPP or site-specific project plan for details.

8.4 Connecting the PurpleAir to a WiFi Network

The PurpleAir has two methods of connection to a WiFi network, general configuration and manual configuration. Manual configuration is only necessary when trying to connect to a network with spaces or special characters in the service set identifier (SSID). At this time the PurpleAir sensors can only connect to WPA/WPA2, 2.4 GHz networks. Both WiFi configuration methods can be performed using a phone, tablet, or PC.

8.4.1 General WiFi Configuration

1. Power on the PurpleAir sensor.
2. On your network connected device, open a web browser and navigate to www.purpleair.com/configure, leave this page open for the next step.
3. On the same device, open the list of available WiFi networks and select the PurpleAir sensor signal "AirMonitor_xxxx", where "xxxx" is the last 4 digits of the sensor ID. This will disconnect your device from the WiFi network and connect it to the sensor.

4. Within 5 seconds of connection to the sensor, click "Connect to Sensor" on the configuration page from step 1 (Step 8.4.1.1). (If this connection fails, repeat steps 8.4.1.2 and 8.4.1.3.)
5. If successful, a new page will load with a list of available WiFi networks. Select your network from the list and enter the WiFi password at the bottom of the page, click "Save" to store the configuration settings.
6. Once successfully connected, the "AirMonitor_xxxx" network will disconnect from your device and disappear from the list of available networks.

8.4.2 Manual WiFi Configuration

1. Power on the PurpleAir sensor.
2. On your network connected device, open a web browser and navigate to http://192.168.4.1/config?ssid=**somename**&pass=**somepass**, where "*somename*" and "*somepass*" are your network SSID and password, respectively. Press enter to load the page, you should get a message saying that the page cannot load, this is expected. Leave this window open for the next step.
3. On the same device, open the list of available WiFi networks and select the PurpleAir sensor signal "AirMonitor_xxxx", where "xxxx" is the last 4 digits of the sensor ID. This will disconnect your device from the WiFi network and connect it to the sensor.
4. Once connected to the sensor, **quickly** refresh the browser window from step 8.4.2.2. (If this connection fails, repeat steps 8.4.2.2 and 8.4.2.3)
5. Once successfully connected, the sensor data should appear in the browser window and the "AirMonitor_xxxx" network will disconnect from your device and disappear from the list of available networks.

8.5 Starting and Stopping Data Recording

The PurpleAir sensors begin logging data as soon as they are powered on. Be sure to keep detailed notes of the time power was supplied as noted in Section 9. At power on, a green light on one side of the microSD card will blink a few times. Immediately after, the blue light on the opposite side of the microSD card will blink periodically, indicating data is being recorded. If the blue light blinks rapidly, data is likely not being recorded properly and the user should check the data file and microSD card seating. To turn off the sensor and stop data recording, disconnect it from the power strip. The sensor should always be powered off prior to removal of the SD card to prevent data corruption.

8.6 Checking the status of an online sensor

If you would like to check on the status of a PurpleAir sensor and it is either publicly available or you have access to the associated email address, you can take the following steps to check on the sensor.

1. Visit https://www.purpleair.com/map
2. Search the name of your sensor of interest in the box in the top left.
3. Once the map centers over your sensor, you can click on the sensor for a status update of the current PM levels from that PurpleAir monitor. You can compare the levels of the A and B sensors

and if they do not compare well there may be a problem with the sensor (as shown in the Figure below).

4. You can click on additional sensors and they will be added on the plot in the top left so that you can compare across sensors.

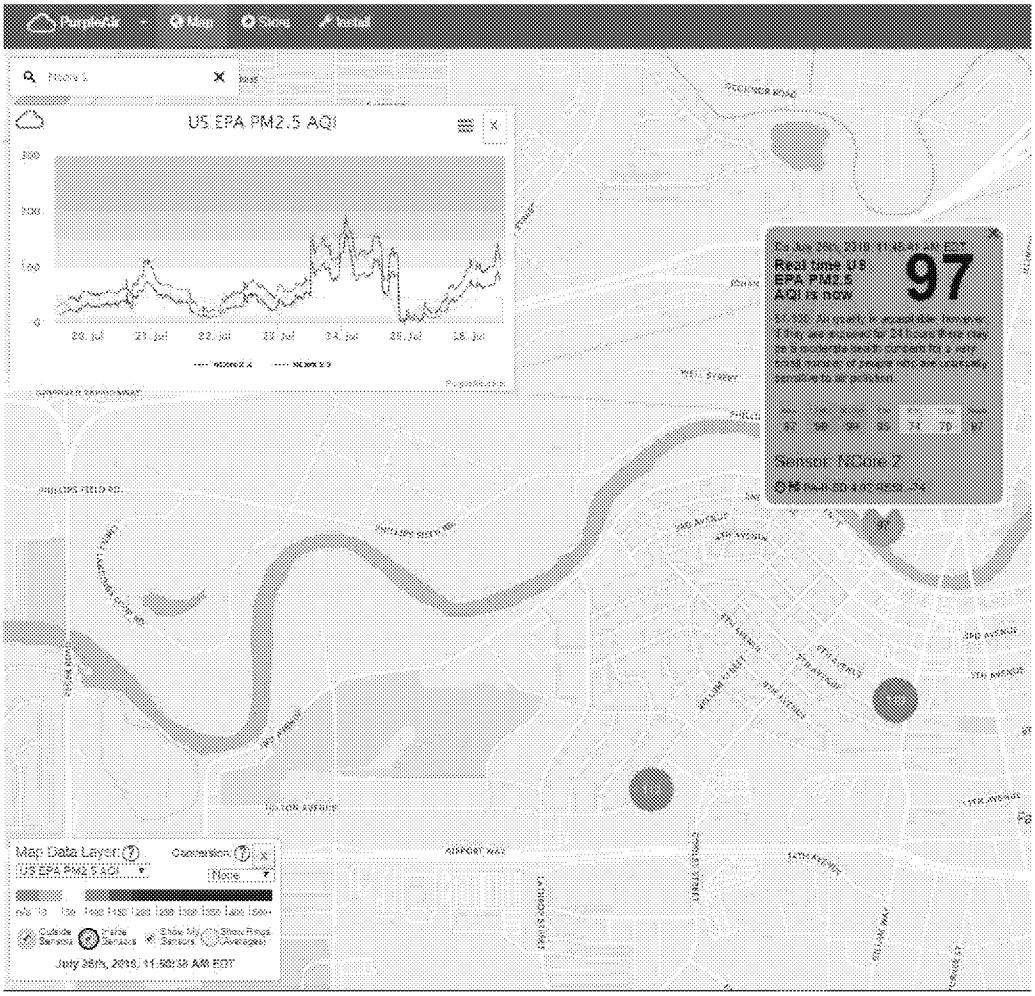


Figure 6. View from Purpleair.com/map when checking on an individual sensor.

Note: The view may be slightly different depending on the browser, plugins, and map version you are looking at (this image: from google chrome 7/26/19)

5. If the sensor is not currently reporting, you will see that here. This may indicate the sensor has lost power, WiFi, or has another problem.

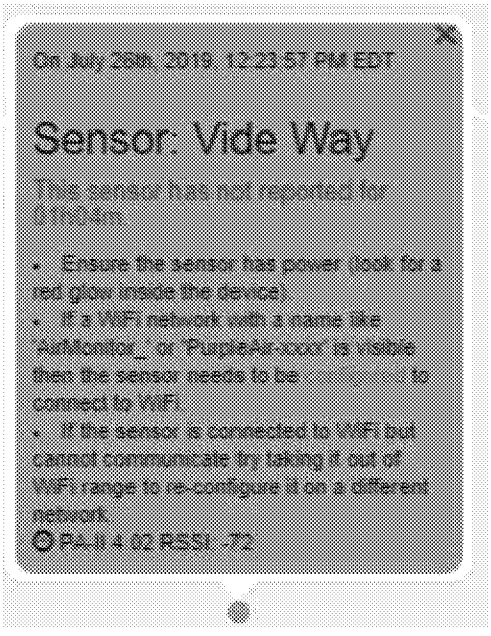


Figure 7. Example of a sensor that has gone offline.

6. Now, or next time you visit the site try restarting the sensor, completing the troubleshooting steps in the error message, and/or visiting https://www2.purpleair.com/community/faq for additional solutions.

8.7 Data Download

8.7.1 Download the data (microSD)

Follow the steps below to stop recording and download data from the device:

1. Turn the sensor off by disconnecting the power.
2. Remove the microSD card from the unit (Figure 2). Using a pair of tweezers, slightly push the microSD card inwards to release it from card docking bay, then pinch the edge of the card and pull gently to remove.
3. Insert the microSD card into an SD card adapter and insert the assembly into the Windows laptop.
4. Select and **Copy** the intended datafile(s). Sensor files are titled 'yyyymmdd.csv' and log files are titled 'yymmdd.log', where 'yyyymmdd' represents the start date. Generally, one data file and one log file will be made each day (dependent on the firmware version).
5. **Paste** the file(s) to the appropriate directory* on the laptop hard drive. *See Section 8.8 for guidelines on erasing the SD card.*
6. It is suggested data collection be verified immediately and before restarting the device. The basic initial check is provided below, further data verification instructions are provided in Section 8.6.

a. Has a data file been created for each day the sensor was deployed? If not, check for power connection issues, improper data card format, or possible improper seating of the SD card into the sensor.

7. Once all files are collected, stop the USB (SD card) device and remove from the laptop.
8. Return the microSD card to the PurpleAir sensor by reinserting the card in the docking bay and gently pressing the card with the tweezers to lock it in place. Be sure to follow the proper card orientation when re-inserting.
9. Power on the device as instructed in Section 8.4. If the blue light flashes repeatedly, the microSD card may not be properly inserted, or the data may not be recording correctly. If this happens, turn off the unit, remove, and re-insert the microSD card and restart.

**Folder directory and file naming structure are site specific determinations and should be identified in the project QAPP. For uses where multiple sensors are collocated, it is suggested that the raw file be updated to include the unit number as a unique identifier.*

8.7.2 Download the data (cloud manual)

This is the recommended download method for smaller downloads of data for PurpleAir monitors uploading data to the PurpleAir cloud via a wifi connection (online). If the PurpleAir monitor was registered in private mode, this method of data download requires that you have access to the Gmail account the PurpleAir monitor was registered with. If the monitor was registered in public mode, then the associated Gmail account is not necessary to have.

1. Go to https://www.purpleair.com/map.
2. Log into the Gmail account associated with the sensor(s) of interest if they are operating in private mode.
3. Locate the sensor on the map or by searching for the sensor name in the search bar in the top left and click on the circle representing that sensor.
4. A box describing recent measurements from the sensor will appear. After a few seconds, text will appear at the bottom of the box, including "get this widget" (Figure 8a).
5. Bring the mouse over "get this widget" and click on "download". This will open a new window to the purpleair.com/sensorlist download tool for that specific sensor.
6. Specify the start and end dates and time average you wish to download.
7. Now you can download the primary and secondary data from the A and B sensors by checking the boxes on the far left of the sensors you are interested in, then clicking "download primary/secondary (A)/(B). Make sure to download both the A and B channels by clicking their respective checkboxes (Figure 8b). Note that the downloaded PurpleAir data has a coordinated universal time (UTC) timestamp and that the time last seen is also in UTC on this page.
8. The channel labels for data downloaded manually from the PurpleAir website are reversed compared to data downloaded using the Thingspeak application programing interface (API) (section 8.7.3). The fields labeled with cf=atm in the manually downloaded data correspond to the fields labeled cf=1 in the data downloaded using API keys, and vice versa (i.e., fields labeled cf=1 in manually downloaded data correspond to fields labeled cf=atm in the API-downloaded data). This is accurate as of 11/27/19.

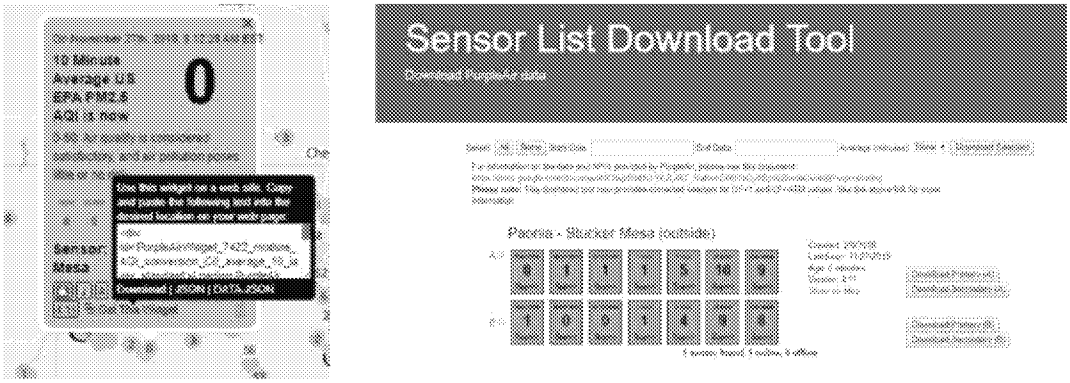


Figure 8. PurpleAir data download page.

8.7.3 Download the data (cloud automatic-with API key)

This method is preferred for automating larger data downloads or in cases where the data user does not have access to the Gmail account used to register the device.

8.7.3.1 Finding the API key and Channel number

If you do not already know the API keys, follow these steps to identify them.

1. Navigate to https://www.purpleair.com/map
2. If this is a private monitor, log into the owner google account that you used to register the monitor by using the Login button in the top right corner.
3. Locate the sensor on the map or search for the sensor name (if known). Click on the circle representing the sensor of interest.
4. Wait for "get this widget" text to appear at the bottom of the box and bring the mouse over this text. Click on the link labeled "JSON".
5. You will find 5 fields of interest for both the A and B sensors (10 total – sensor name, 2 - channel IDs, 2 - API keys). In the example below, sensor A is labeled "Paonia-Stucker Mesa" and sensor B is labeled "Paonia-Stucker Mesa B". The channel IDs are labeled "THINGSPEAK_PRIMARY_ID" and "THINGSPEAK_SECONDARY_ID" and the API keys are labeled, "THINGSPEAK_PRIMARY_ID_READ_KEY", and "THINGSPEAK_SECONDARY_ID_READ_KEY". Record the values between the quotes for all of these fields. They will be needed to access the data via the API (Section 7.8.3.2). Here's an example with these values in bold:


```
{"mapVersion":"0.3","baseVersion":"7","mapVersionString":"","results":[{"ID":
7422,"Label":"Paonia - Stucker
Mesa","DEVICE_LOCATIONTYPE":"outside","THINGSPEAK_PRIMARY_ID":"423102","THING
SPEAK_PRIMARY_ID_READ_KEY":"AJC24PSMZ6MYE80Z","THINGSPEAK_SECONDARY_ID":"4231
03","THINGSPEAK_SECONDARY_ID_READ_KEY":"MRGQDOE6IGAQGNF8","Lat":38.860887,"Lo
n":-
107.647995,"PM2_5Value":"0.0","LastSeen":1574864174,"Type":"PMS5003+PMS5003+B
ME280","Hidden":"false","DEVICE_BRIGHTNESS":"15","DEVICE_HARDWAREDISCOVERED":
"2.0+OPENLOG+15833 MB+DS3231+BME280+PMSX003-B+PMSX003-
A","Version":"4.11","LastUpdateCheck":1574862731,"Created":1518136411,"Uptime
":"1075021","RSSI":"-
67","Adc":"0.0","p_0_3_um":"108.87","p_0_5_um":"26.84","p_1_0_um":"1.57","p_2
```

```
_5_um":"0.93","p_5_0_um":"0.58","p_10_0_um":"0.41","pm1_0_cf_1":"0.0","pm2_5_
cf_1":"0.0","pm10_0_cf_1":"0.29","pm1_0_atm":"0.0","pm2_5_atm":"0.0","pm10_0_
atm":"0.29","isOwner":0,"humidity":"38","temp_f":"34","pressure":"816.2","AGE
":1,"Stats":"{\"v\":0.0,\"v1\":0.1,\"v2\":0.11,\"v3\":0.19,\"v4\":1.15,\"v5\"
:2.36,\"v6\":2.09,\"pm\":0.0,\"lastModified\":1574864174549,\"timeSinceModifi
ed\":119998}"},{"ID":7423,"ParentID":7422,"Label":"Paonia - Stucker Mesa
B","THINGSPEAK_PRIMARY_ID":"423104","THINGSPEAK_PRIMARY_ID_READ_KEY":"KWJ6KI0
WTPIFALI8","THINGSPEAK_SECONDARY_ID":"423106","THINGSPEAK_SECONDARY_ID_READ_K
EY":"SEIBD46YGMUU735V","Lat":38.860887,"Lon":-
107.647995,"PM2_5Value":"0.0","LastSeen":1574864174,"Hidden":"false","Created
":1518136411,"Adc":"0.00","p_0_3_um":"104.61","p_0_5_um":"31.06","p_1_0_um":"
1.25","p_2_5_um":"0.17","p_5_0_um":"0.0","p_10_0_um":"0.0","pm1_0_cf_1":"0.0"
,"pm2_5_cf_1":"0.0","pm10_0_cf_1":"0.0","pm1_0_atm":"0.0","pm2_5_atm":"0.0","
pm10_0_atm":"0.0","isOwner":0,"AGE":1,"Stats":"{\"v\":0.0,\"v1\":0.05,\"v2\":
0.06,\"v3\":0.12,\"v4\":0.97,\"v5\":2.12,\"v6\":1.9,\"pm\":0.0,\"lastModified
\":1574864174550,\"timeSinceModified\":119998}"}]}
```


8.7.3.2 Download from the API directly: using PowerShell

You must use a computer that has windows PowerShell to be able to download using this method.

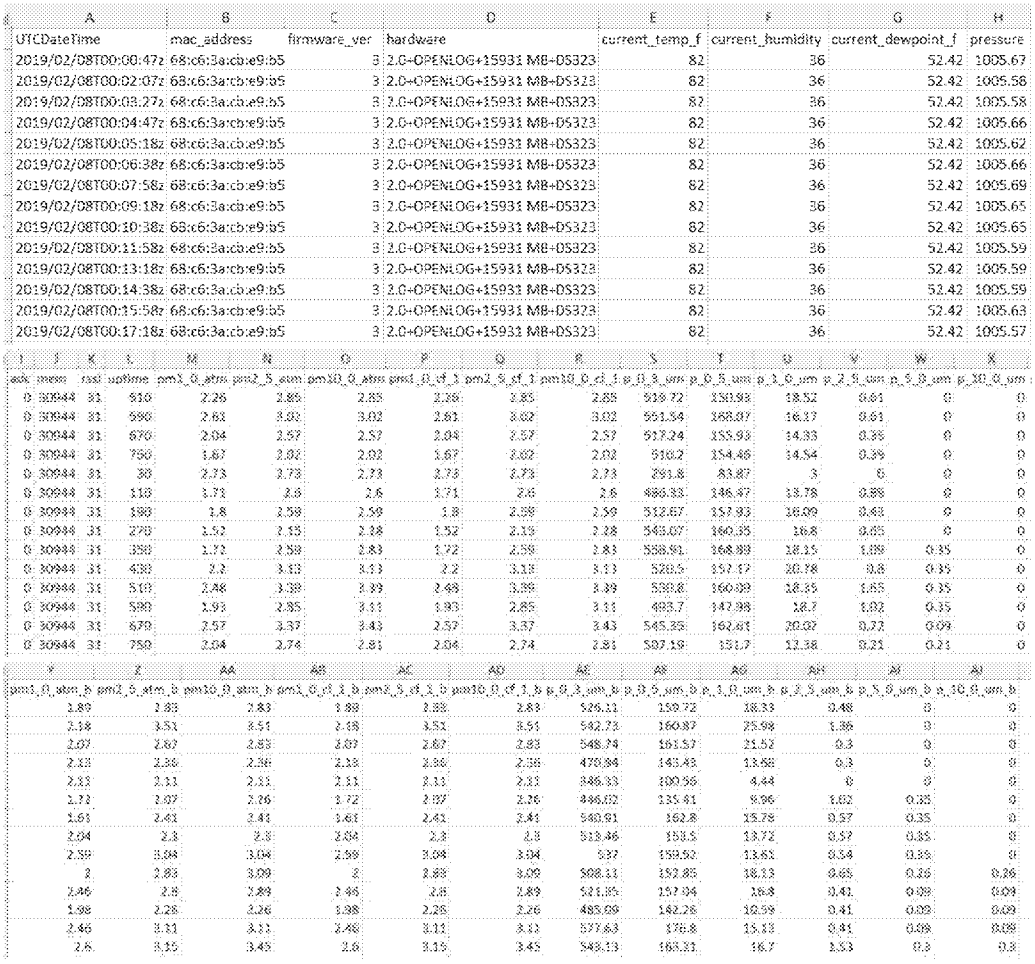
1. Locate and open the windows PowerShell app on your computer.
2. Open a blank text file in notepad
3. Copy and paste the text from section 11.4 (starting below the section title) into the blank text file.
4. You will need to update the location you would like to save data (currently: j:\temp\PA) at both the beginning and end of the document
5. Next you will need to update the table including (Reporting Organization, Channel ID, API key, Start Date). There should be 4 entries for each PurpleAir monitor assuming you want both primary and secondary data from the A and B sensors.
6. Next you will want to update the offset (currently: $offset=9) to the number of hours ahead or behind (negative) UTC is from your local standard time (LST) (e.g. 6 for central standard time (CST), 5 for eastern standard time (EST)). If you set this to zero, you will not get midnight to midnight data from the download as your first hour of data will be at 0:00 UTC.
7. Save this text file so that you can update the start dates and use again if you want to download data from these sites in the future.
8. Copy the text file and paste it into your PowerShell.
9. Press enter to run the script.
10. If this does not generate files, check your keys and try saving to a different location in case you do not have permissions to save in the initial location.

8.8 Reviewing the Data

To check data integrity, each file is imported to Microsoft Excel. The steps outlined below may differ based on the version of Excel being used. ***Please remember, raw data files ('yyyymmdd.csv' format) should NOT be altered and should be kept for the duration of any study.***

1. Open a new blank Excel workbook.
2. Under the Data tab, navigate to Get Data → From File → From Text/CSV.
3. Locate the appropriate file, select and click Import.
4. In the import wizard, select Comma and Tab from the Delimiter drop down and click load.

5. Once the data is imported it should resemble the data shown in Figures 9-12 depending on how the data was downloaded.



A	B	C	D	E	F	G	H
UTCDateTime	mac_address	firmware_ver	hardware	current_temp_f	current_humidity	current_dewpoint_f	pressure
2019/02/08T00:00:47z	68:c6:3a:cb:e9:b5	3	2.0+OPENLOG+15931	MB+DS323	82	36	52.42	1005.67
2019/02/08T00:02:07z	68:c6:3a:cb:e9:b5	3	2.0+OPENLOG+15931	MB+DS323	82	36	52.42	1005.58
2019/02/08T00:03:27z	68:c6:3a:cb:e9:b5	3	2.0+OPENLOG+15931	MB+DS323	82	36	52.42	1005.58
2019/02/08T00:04:47z	68:c6:3a:cb:e9:b5	3	2.0+OPENLOG+15931	MB+DS323	82	36	52.42	1005.66
2019/02/08T00:05:18z	68:c6:3a:cb:e9:b5	3	2.0+OPENLOG+15931	MB+DS323	82	36	52.42	1005.62
2019/02/08T00:06:38z	68:c6:3a:cb:e9:b5	3	2.0+OPENLOG+15931	MB+DS323	82	36	52.42	1005.66
2019/02/08T00:07:58z	68:c6:3a:cb:e9:b5	3	2.0+OPENLOG+15931	MB+DS323	82	36	52.42	1005.69
2019/02/08T00:09:18z	68:c6:3a:cb:e9:b5	3	2.0+OPENLOG+15931	MB+DS323	82	36	52.42	1005.65
2019/02/08T00:10:38z	68:c6:3a:cb:e9:b5	3	2.0+OPENLOG+15931	MB+DS323	82	36	52.42	1005.65
2019/02/08T00:11:58z	68:c6:3a:cb:e9:b5	3	2.0+OPENLOG+15931	MB+DS323	82	36	52.42	1005.59
2019/02/08T00:13:18z	68:c6:3a:cb:e9:b5	3	2.0+OPENLOG+15931	MB+DS323	82	36	52.42	1005.59
2019/02/08T00:14:38z	68:c6:3a:cb:e9:b5	3	2.0+OPENLOG+15931	MB+DS323	82	36	52.42	1005.59
2019/02/08T00:15:58z	68:c6:3a:cb:e9:b5	3	2.0+OPENLOG+15931	MB+DS323	82	36	52.42	1005.63
2019/02/08T00:17:18z	68:c6:3a:cb:e9:b5	3	2.0+OPENLOG+15931	MB+DS323	82	36	52.42	1005.57

I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
adc	mem	rssi	uptime	pm1_0_atm	pm2_5_atm	pm10_0_atm	pm1_0_cf_1	pm2_5_cf_1	pm10_0_cf_1	p_0_3_um	p_0_5_um	p_1_0_um	p_2_5_um	p_5_0_um	p_10_0_um
0	30944	31	810	2.26	2.85	2.85	2.85	2.85	2.85	918.72	150.93	18.52	0.61	0	0
0	30944	31	590	2.61	3.01	3.02	2.81	3.02	3.02	951.54	168.07	16.17	0.61	0	0
0	30944	31	670	2.04	2.57	2.57	2.04	2.57	2.57	917.24	155.93	14.33	0.35	0	0
0	30944	31	750	1.67	2.02	2.02	1.67	2.02	2.02	910.2	154.46	14.54	0.39	0	0
0	30944	31	30	2.73	2.73	2.73	2.73	2.73	2.73	291.8	83.87	3	0	0	0
0	30944	31	110	1.71	2.6	2.6	1.71	2.6	2.6	486.83	146.47	13.78	0.88	0	0
0	30944	31	190	1.8	2.59	2.59	1.8	2.59	2.59	512.67	157.93	16.09	0.43	0	0
0	30944	31	270	1.52	2.15	2.28	1.52	2.15	2.28	543.07	160.35	16.8	0.65	0	0
0	30944	31	350	1.72	2.59	2.83	1.72	2.59	2.83	558.91	168.89	18.15	1.09	0.35	0
0	30944	31	430	2.2	3.13	3.13	2.2	3.13	3.13	520.5	157.17	20.78	0.8	0.35	0
0	30944	31	510	2.48	3.39	3.39	2.48	3.39	3.39	538.8	160.69	18.35	1.65	0.35	0
0	30944	31	590	1.93	2.85	3.11	1.93	2.85	3.11	493.7	147.98	18.7	1.02	0.35	0
0	30944	31	670	2.57	3.37	3.43	2.57	3.37	3.43	545.35	162.61	20.02	0.72	0.09	0
0	30944	31	750	2.04	2.74	2.81	2.04	2.74	2.81	587.19	151.7	12.38	0.21	0.21	0

Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ
pm1_0_atm_b	pm2_5_atm_b	pm10_0_atm_b	pm1_0_cf_1_b	pm2_5_cf_1_b	pm10_0_cf_1_b	p_0_3_um_b	p_0_5_um_b	p_1_0_um_b	p_2_5_um_b	p_5_0_um_b	p_10_0_um_b
2.89	2.83	2.83	2.89	2.83	2.83	526.11	159.72	18.33	0.48	0	0
3.18	3.51	3.51	3.18	3.51	3.51	542.73	160.87	25.98	1.36	0	0
2.67	2.67	2.83	2.67	2.67	2.83	548.74	161.57	21.52	0.3	0	0
2.33	2.36	2.36	2.33	2.36	2.36	470.84	143.43	13.68	0.3	0	0
2.33	2.33	2.33	2.33	2.33	2.33	486.33	100.56	4.44	0	0	0
2.72	2.07	2.26	2.72	2.07	2.26	486.02	135.41	9.96	1.02	0.35	0
1.61	2.41	2.41	1.61	2.41	2.41	540.91	162.8	15.78	0.57	0.35	0
2.04	2.3	2.3	2.04	2.3	2.3	513.46	153.5	13.72	0.57	0.35	0
2.59	3.04	3.04	2.59	3.04	3.04	537	159.52	13.61	0.54	0.35	0
2	2.83	3.09	2	2.83	3.09	508.11	152.85	18.33	0.65	0.35	0.26
2.46	2.8	2.89	2.46	2.8	2.89	521.85	157.04	16.8	0.41	0.09	0.09
1.98	2.26	2.26	1.98	2.26	2.26	485.09	142.26	10.59	0.41	0.09	0.09
2.46	3.11	3.11	2.46	3.11	3.11	577.63	176.8	15.13	0.41	0.09	0.09
2.6	3.15	3.45	2.6	3.15	3.45	548.13	163.31	16.7	1.53	0.3	0.3

Figure 9: Data in Excel from SD Card

	A	B	C	D	E	F	G	H	I	J	K
1	created_at	entry_id	PM1.0_CF	PM2.5_CF	PM10.0_C	UptimeMi	ADC	Temperat	Humidity	PM2.5_CF_1_ug/m3	
2	2019-07-03 00:01:51 UTC	251669	3.28	6.36	6.61	9608	-84	93	59	6.36	
3	2019-07-03 00:03:51 UTC	251670	2.94	5.08	5.48	9610	-83	93	59	5.08	
4	2019-07-03 00:05:54 UTC	251671	3.09	4.96	6.49	9612	-87	93	58	4.96	
5	2019-07-03 00:07:51 UTC	251672	2.33	5.33	5.72	9614	-82	93	58	5.33	
6	2019-07-03 00:09:53 UTC	251673	2.58	5.82	6.43	9616	-83	93	58	5.82	
7	2019-07-03 00:11:52 UTC	251674	3.03	4.87	5.49	9618	-82	92	58	4.87	
8	2019-07-03 00:13:51 UTC	251675	3.04	5.37	6.63	9620	-83	93	59	5.37	
9	2019-07-03 00:15:51 UTC	251676	2.84	5	5.83	9622	-84	92	58	5	
10	2019-07-03 00:17:51 UTC	251677	2.62	5.25	5.25	9624	-82	93	58	5.25	
11	2019-07-03 00:19:53 UTC	251678	3.06	5.74	7.27	9626	-83	92	59	5.74	
12	2019-07-03 00:21:51 UTC	251679	2.97	5.17	5.72	9628	-83	92	59	5.17	

Figure 10. Primary data file in Excel from sensor list download

	A	B	C	D	E	F	G	H	I	J	K
1	created_at	entry_id	0.3um/dl	0.5um/dl	1.0um/dl	2.5um/dl	5.0um/dl	10.0um/dl	PM1.0_CF	PM10_CF_1_ug/m3	
2	2019-07-03 00:01:52 UTC	250538	840.42	225.28	49.03	5.56	0.5	0	3.28	6.61	
3	2019-07-03 00:03:53 UTC	250539	715.41	199.58	39.19	2.81	0.38	0.38	2.94	5.48	
4	2019-07-03 00:05:55 UTC	250540	715.15	201.21	41.06	3.56	2.09	1.24	3.09	6.49	
5	2019-07-03 00:07:53 UTC	250541	676.22	179.61	46.41	3.97	0.44	0	2.33	5.72	
6	2019-07-03 00:09:55 UTC	250542	700.29	191.57	44.65	5.94	0.95	0.49	2.58	6.43	
7	2019-07-03 00:11:53 UTC	250543	722.24	197.1	43.9	2.48	1.02	0.25	3.03	5.49	
8	2019-07-03 00:13:53 UTC	250544	716.78	199.04	42.27	5.85	1.82	0.93	3.04	6.63	
9	2019-07-03 00:15:53 UTC	250545	730.08	192.33	42.97	3.12	1.47	0.12	2.84	5.83	
10	2019-07-03 00:17:52 UTC	250546	696.92	194.51	42.68	1.29	0	0	2.62	5.25	
11	2019-07-03 00:19:55 UTC	250547	723.68	202	49.19	4.61	1.87	1.1	3.06	7.27	
12	2019-07-03 00:21:55 UTC	250548	732.14	196.17	38.31	2.65	0.77	0.31	2.97	5.72	
13	2019-07-03 00:23:58 UTC	250549	716.6	201.07	50.26	4.29	1.18	0	2.76	6.47	

Figure 11. Secondary data file in Excel from Purpleair.com/sensorlist download

Note: Column A of the example data file (Figures 9-12) is the date/timestamp in UTC. Once the time field has been reformatted (Section 8.7), the time column will need to be adjusted to the local time zone (i.e. eastern standard time (EST) time is UTC-5).

6. If you are unable to open the file properly (i.e. the file is not readable):
    a. Make sure an appropriate program is being used (i.e. Microsoft Excel).
    b. Attempt to download the data again.
7. Once the data has successfully imported to Excel, verify that:
    a. The columns contain the appropriate data for the header *(as displayed in Figures 9-12)*.
    b. The first data row contains a time of either '00:00:00' representing the start of the new day or is consistent with the logging start time.
    c. The last row contains a time e.g.'23:59:59' representing the last timestamp associated with the day or is consistent with the logging stop time.
    d. The volume of data is acceptable for the operating time. While recording data for a period of 24 hours at 80 second intervals, the file should contain about 650 rows and the file size should be approximately 300KB. *Note that if the PurpleAir sensor is not connected to a network, the data stream may be periodically interrupted by several lines of text (depending on firmware version).*
    e. The mac address from the data files (Column B) matches the mac address on the device (from offline data only – see Figure 9).
8. If applicable, open the previously imported data file and ensure the date and time stamp from the last record of the file closely precedes that of the first record from the new file. If not, search for an explanation or missing data file.
9. ***If this device is being used in support of EPA-based research, send a copy of these electronic files to the appropriate EPA research lead via email or using an EPA shared drive (e.g., O:, L:) or FTP site. This can be done by copying the entire folder. The EPA will maintain a central repository of all extracted data.***

8.9 Converting the Date/Time in Excel

The following procedure can be used to separate the Date/Time column and remove the extraneous characters.

1. After importing the data to Excel, add two columns to the left of Column A.

2. Remove the "UTCDateTime" header (now Column C), otherwise the next step will not work properly.
3. Select the entire UTCDateTime column.
4. Under the Data tab, select Text to Columns.
5. In the wizard, select Delimited and click next.
6. Select Other, put the letter T in the box and click next.
7. Select General and under Destination highlight cell A1, then click finish. The date and time should now be in two columns (A & B) and the date column should now be in the proper MM/DD/YYYY format.
8. Next, select the new time column.
9. Under the Home tab, select Find & Select→ Replace.
10. Under Find, enter z. Leave the Replace field blank and select Replace All. The time column should now be in the HH:MM:SS format. Steps 11-13 instruct on how to round the time field to the nearest minute, as may be required by some analysis tools.
11. Insert a column to the right of the new time column and add a header (i.e. Adjusted Time).
12. In the first cell under the header insert the equation "=MROUND(CELL#,0:01)", where cell is the first cell in the time column and "0:01" is the multiple. Copy the formula down the rest of the column.
13. Highlight the adjusted time column. Under the Formats dropdown, select More Formats>Time and select desired time format.

8.10 Deleting Existing Data

While it is good practice to remove existing data stored prior to the current data collection activity, it is not required in this case as the files are named sequentially. Typically, the microSD Card can hold several months of 1-minute data before getting filled. Data can be deleted as necessary to complete field measurements.

9 Data and Records Management

Records should be made during sensor deployment, start-up, shut-down and data transfer. Field notes including observations about nearby or transient pollution sources, weather, and/or instrument operation may be useful in interpreting the sensor data. All such records should be kept using an EPA research or field notebook or form in archival quality black ink and should be marked with the project QAPP ID, location, device ID, date and time or visit and/or data transfer, and observer's name and signature. Any co-observers should also be recorded. A hard-copy of these notes should be maintained for the lifetime of the project, and if collected in support of an EPA research project, must be provided to the EPA research lead. An electronic research notebook may also be used in addition to or in place of a paper research notebook.

Raw data files will not contain any edits performed by Staff. Any files that contain any analysis will be saved onto the EPA shared drive using a different name and all analysis will be recorded into the research notebook (hard-copy or approved electronic format). The analysis consists of, but not limited to: graphs, statistical tests, notes, conclusions, etc. Any non-handwritten notes will be attached to the lab notebook page and the author will sign and date the edge. Notebook record entries will be reviewed by other members of the team and then an employee outside of the team.

Quality control and assurance work, file concatenation, and data evaluation will all start with the raw data collected by the sensor. ***If this device is being used in support of EPA-based research, a copy of the complete and verified data file for each sensor and the research notebook should be provided to the EPA research lead.***

10 Quality Assurance/Quality Control

This SOP is intended ONLY to explain the basic operating procedures of the device such as instrument power-on and power-off procedures, data collection, and data recovery. Project specific QC and QA procedures for the data produced should be developed independently and followed. At a minimum, the recovered data files will be reviewed to look for data gaps and deviations from the expected data files structure (missing lines, columns, or cells within the data file). Unexplained data gaps and deviations will be investigated and troubleshooting procedures implemented, where possible. All efforts should be recorded in the research notebook (see Section 9). As necessary, this SOP will be updated to try to eliminate future data loss.

11 Resources

The following resources may be helpful. Some resources may be restricted to EPA personnel or project partners.

[redacted]

11.2 PurpleAir documents

Using PurpleAir Data Page:
https://docs.google.com/document/d/15ijz94dXJYAZLi9iZ_RaBwrZ4KtYeCy08goGBwnbCU/edit#

11.3 PurpleAir FAQs website:

https://www2.purpleair.com/community/faq

11.4 PowerShell script for API data download

```
#This code was written by Sean Fitzsimmons, Iowa Department of Natural Resources
#Modified by Karoline Johnson 7/12/19

# create PA directory if it doesn't already exist
#You may need to change the directory you write to depending on the security settings on your computer
#External devices (flash drive) may be easier
#This example assumes you are writing to a drive j but update for the drive of your flash drive or other
        desired location.
#Here's an additional example if you have access to your c drive:
#md -Force c:\temp\PA | Out-Null

md -Force j:\temp\PA | Out-Null
<#
Uncomment the next line to delete all files in the home directory to clean up between runs;
all the old files must be closed, or the script will hang
#>

#ENTER API KEYS, ETC. HERE!
# You will need to update all these below with your sensor names, channel IDs, API key, and start dates.
# The format used in the rows below is: (Sensor name, Channel ID, API key, Start Date)
#See the example below for open source data from Alaska
$IowaPA=@(
("Ncore","599388","ZQ08WBD0RP32MSHP","7/12/2019"),
("Ncore","599389","7FYHQD0VW1N59PTH","7/12/2019"),
("Ncore B","599390","E81YTMI867007UN8","7/12/2019"),
("Ncore B","599391","VI8KUWBWT3IEL6V6","7/12/2019"),
("NCore 2","583465","DVES8U6IXYSV2SG0","7/12/2019"),
("NCore 2","583466","CUXEI571Q1EXR2WW","7/12/2019"),
("Ncore 2 B","583467","HP1Y8XE12UPBFGBS","7/12/2019"),
("Ncore 2 B","583468","KZS7G5IOTWDP8FJZ","7/12/2019"),
("Ncore 3","666006","H6JBLR24DNECCR5L","7/12/2019"),
("Ncore 3","666007","YUCUSAG739TI7BID","7/12/2019"),
("Ncore 3 B","666008","HTSVHH26TSR8NUX2","7/12/2019"),
("Ncore 3 B","666009","QLE7S8Y2FHTGYMKL","7/12/2019"))

$NumberOfChannels=$IowaPA.Count
```

```
For ($i=0; $i -lt $NumberOfChannels; $i++) {

$channels=$IowaPA[$i][1]
$api_key=$IowaPA[$i][2]
$startdate=$IowaPA[$i][3]

$mylabel=$IowaPA[$i][0] +"-"+ $IowaPA[$i][1]

#create output file that includes the time the script was run

$outfile="J:\temp\PA"+ $mylabel + "_" + $(get-date -f MM_dd_yy_hh_mm_ss) + ".csv"

#write the identifying information for the channel to the screen

echo($mylabel)

#build strings for api query

$url="https://api.thingspeak.com"

# Create variables for start and end dates for query loop

<#
Purple air stores data with a UTC timestamp. EPA monitors have an LST timestamp,
So to compare data sets we will ultimately want to convert the PA timestamps to LST in a spreadsheet.
In this script we download the UTC PA data corresponding to LST days.
Examples:
UTC is six hours ahead of LST(Central Standard Time) in Iowa.
UTC is 9 hours ahead of LST(Alaska Standard Time) in Alaska
Note if you miss this step it won't impact your data quality
you will just be missing a few hours of your daily average
#>
#EDIT THIS OFFSET FOR YOUR TIME ZONE!
$offset=9

# Use the channel's start date (coverted to UTC) for the first day to query

$startloopLST=Get-Date $startdate
$startloop=$startloopLST.AddHours($offset)

#use current date-time (converted to UTC) as the last day to query
```

```
$now=Get-Date
$nowUTC=$now.ToUniversalTime()
$endloop=$nowUTC

# Make start and end dates for the query of the first day's data and make strings

$start=$startloop
$end=$start.AddDays(0).AddHours(23).AddMinutes(59).AddSeconds(59)
$startstring= $start.tostring("yyyy-MM-dd"+"T"+"HH:mm:ss"+"Z")
$endstring=$end.tostring("yyyy-MM-dd"+"T"+"HH:mm:ss"+"Z")

#Create query for header; we dont need any data, so the start and end dates are the same.

$query=$url+"/channels/"+$channels+"/"+"feed.xml?"+"api_key="+$api_key+"&start="+$startstring+"&en
        d="+$startstring

# run api query, store results in variable $xml

$xml = Invoke-RestMethod -Uri $query -Method Get -TimeoutSec 300;

# make the header from the xml

$header=('monitor-id','channel-id', 'created-at', 'entry-id', $xml.channel.field1, $xml.channel.field2,
        $xml.channel.field3,
        $xml.channel.field4,$xml.channel.field5,$xml.channel.field6,$xml.channel.field7,$xml.channel.field
        8)

# write header to outfile; we will append each days data to this file.

$header-join ", "> $outfile

# Loop, querying one day at a time and appending to outfile until final day for the query is reached

Do
{

$query=$url+"/channels/"+$channels+"/"+"feed.xml?"+"api_key="+$api_key+"&start="+$startstring+"&en
        d="+$endstring

echo( $start.tostring("MM-dd-yy"))

$xml = Invoke-RestMethod -Uri $query -Method Get -TimeoutSec 300;
```

```
$nodes=$xml.channel.feeds.feed

#extract each row of data in the days data from the array "nodes" and put it in "array".

foreach ($node in $nodes){

# Extract the first row of data from the xml and append to the channel output file

$array= ($xml.channel.name, $xml.channel.ID.'#text', $node.'created-at'.'#text',$node.'entry-
        id'.'#text',$node.field1,$node.field2,$node.field3,$node.field4,$node.field5,$node.field6,$node.fiel
        d7,$node.field8)
$array-join ", ">> $outfile
}

# create start and end dates for next days query

$start=$start.AddDays(1)
$end=$start.AddDays(0).AddHours(23).AddMinutes(59).AddSeconds(59)
$startstring= $start.tostring("yyyy-MM-dd"+"T"+"HH:mm:ss"+"Z")
$endstring=$end.tostring("yyyy-MM-dd"+"T"+"HH:mm:ss"+"Z")

# loop while the next day to query day is less than last day of the query.

}While ($start-lt $endloop)
}
```